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November 1953

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Psychophysiology in Food Acceptance Research

37th A.D.A. Annual Meeting, Philadelphia, October 26–29, 1954

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Quality Food Means More Than Recipes

Making Large Quantity Recipes from Family Favorites

PEARL JACKSON ALDRICH, Ph.D.

Associate Professor and Director of Test Kitchen, School of Home Economics, Michigan State College, East Lansing

JUDGING from the number of requests for information on converting family-size recipes to large quantity, I am convinced there is a definite trend back to the country kitchen we all recall so fondly. Apparently there is a widespread belief that if we could only increase the recipe for gingerbread that Mother used to make, we would surely be famous overnight. Or, we may recall the odor of freshly baked bread cooling in Grandma's kitchen and be certain that this recipe would revolutionize food services and the baking industry throughout the world. And, never have we eaten such custard pie as Aunt Betsy Bower could pull from the oven of her old wood-burning range—golden, delicately quivering, and heavenly with the fragrance of freshly grated nutmeg. If only we could convert these family-size recipes for institutional use!

All of us treasure some fond memories, especially where foods are concerned. In fact, we are likely to be a bit incensed when psychologists suggest that our impressions of the perfection of foods may be somewhat entangled with happy associations with other things. Be all that as it may, we do sometimes convince ourselves that simply a change of recipes is all that is necessary to bring the quality of our foods to the desired level. Unfortunately, the process is rarely that simple.

Ten Factors Essential to Quality Food Production

A special or unique recipe may add interest and variety to our offerings, but the recipe alone will not turn the trick. With careful, methodical, stepwise procedure it is not impossible to develop quantity recipes for many items from good, family-size recipes. However, unless one is willing to go about such development with patience and meticulous care of detail, it may be better to direct one's time and effort in other pathways for quicker results in the improvement of quality in large-scale production. From working with various food services in their efforts to improve food quality, I would suggest the following factors as essential to the production of foods with what we fondly call "that homemade touch."

WHAT ARE YOUR STANDARDS?

A crystal-clear analysis of what you, as a food service manager, really want in quality of food. This must be accompanied by a realistic evaluation of the reasons you may be falling short of your goal. No amount of wishful thinking and no file of new, perfectly standardized recipes will achieve this dream for you. Success will require your best planning and execution of the details of a purposeful program. If you are unwilling or unready to become involved to this degree, then the remainder of this article is not for you.

SUPERVISORS MUST ANALYZE STANDARDS

Food service supervisors must have a clear concept of standards of quality for all products. Furthermore, these supervisors must be (or must be taught to be) skilled in the techniques of "selling" the importance of quality to their production workers. You, as manager, must make the master copy of the quality plan. Your supervisors, in turn, must be equipped with the blueprints, and your cooks, with the patterns for their part of production. You will get no farther on the road to quality without these things than you would get on the highway with a car which had been built by a group of workers left to their own resources in producing and assembling the parts.

GOOD RECIPES

Good recipe sources. Such source material is, to be sure, an excellent tool. It is a *must* if foods of consistently high quality are to be produced. However, let us dispel at once any illusions that a fat file of excellent recipes is any assurance that you will have a clientele beating a path to your door. New recipes are no more a cure for a sagging food service than is a bottle of patent medicine a cure for gout. Let us stop deluding ourselves that some magic formula for converting family-size recipes to quantity recipes is a solution to our dilemma of producing mediocre foods. Such a formula exists only in the dreams of frustrated food service managers and dietitians who have grown weary of the daily difficulties of their work.

Included at the end of this article is a list of good source material (1–9). The developing and standardizing of these recipes has been carefully done by people with considerable training and experience. Much of the hard work has been done for you. However, many of you still may be obsessed with the desire to take on this task yourselves, brushing over the great amount of available source material. At this point, I might suggest that you will have a certain amount of individual adapting to do, even though you begin with reliable source material. Perhaps your budget will not permit a 2.5-oz. allowance of lobster per portion for lobster à la Newburg. You may wish to check for acceptability a recipe from a reliable source which contains only 2 oz. lobster meat per portion. Your cake tins, filled with 1 lb. 4 oz. of batter, may spill all over the oven. Therefore, you will need to adapt whatever recipe you use for yield, according to your own equipment. These things are only a beginning. It is rare, indeed, to be able to transfer, completely unchanged, a file of recipes from one unit to another without some adaptation.

In addition to the source materials listed here, there are many others. Numerous commercial food companies employ trained home economists to work out recipes and methods for the best use of their products. The results of such work are often available without cost.

CLEAR DIRECTIONS

Clear, concise, simplified directions and procedures. This part of the recipe is just as important as high quality ingredients and correct proportions. Vague directions, written or verbal, are often responsible for spoiling your efforts toward quality improvement.

I recall, with a shiver, my own undoing on more than one occasion when vague directions brought dire results. I once instructed a young girl at the dessert counter that we would have "mixed desserts" for lunch. Of course, I knew I meant "assorted" or "a choice of" desserts. Unfortunately, my instructions were not that clear to her. The girl had taken me literally, and on the counter were dishes full of exactly what I had ordered—mixed desserts! I shall never forget the sight. Imagine, if you can, a mixture of raspberry gelatin, chocolate pudding, canned prune plums, and a few pieces of fresh pineapple perched wanly in the midst of it all!

I need not add anything further about the importance of clear, specific directions that *say* what they mean. Specific directions are a necessity, whether they are a part of a recipe or a part of daily, verbal instructions to production employees. Surely you have all had similar experiences for which you, and you alone, were entirely responsible. By all means, in striving to improve or maintain quality in food, remember to be clear and specific in giving written or verbal directions.

HIGH QUALITY INGREDIENTS

Good quality raw materials. There is no substitute for good ingredients if one's goal is excellent food. Neither the cook nor the recipe can make the product better than the ingredients that go into it. In our enthusiasm for streamlining the budget to meet the recommended percentage for raw food cost, we sometimes are guilty of unsound economy measures. Have you ever known a supervisor to skim the cream from the top of the cans of bulk milk to curtail the purchase of coffee cream, and then have to explain why the sauce for the creamed potatoes that day didn't seem quite right? Discarded portions of each serving of potatoes put the pennies saved on cream right into the garbage can. Perhaps a better place to save a few pennies would have been to watch dining room "returns" of food.

Be sure you know quality. Be sure you buy the quality required for your specific purpose. Be sure you receive the quality for which you pay. And last, but just as important, be sure you use the quality foods you obtain so that your customers are aware that you deal in quality food from the order blank to the table.

CONTINUOUS CHECKING

Constant checking for maintenance of quality at all stages of production. This is an unremitting, never-ending necessity. It is your job to keep it uppermost in the minds and the duties of your food service supervisors. You must make it clear that this is the core of their whole job. You must also make certain that their time and energy is channeled in this direction and is not dispersed to such tasks as filling in for the absent salad girl, silver polisher, or caterer's helper. Help your supervisors establish the policy of sending no "made" item to the customer until it has passed inspection. Sharpen their five senses and guide them in developing a sixth, a real "food sense." Insist that they open their eyes, develop their sense of smell and taste, learn to use their sense of touch, and do something about the comments they hear about the food they serve. The three monkeys, "see no evil," "hear no evil," and "speak no evil" may be all right in some situations, but in the kitchen they can make a fourth monkey out of you in no time.

CONTROL OF FINAL MINUTES OF PRODUCTION

Control of the final stages of production. On one hand I can count the number of kitchens in which I have worked where no one was in a hurry. Why is it that most cooks seem obsessed with a morbid fear of having work to do during the serving period? The early stages of preparation in many kitchens may best be described by the word "pandemonium." A friend aptly describes this frantic race: "Everyone goes rapidly in six directions at the same time." And in these first two or three hours of confusion

and rush, all of your efforts at quality control may easily be defeated.

A slightly warm raspberry pie, with a bit of red juice flowing from the cut and the tickling aroma of the warm fruit, cannot be compared with a pie that is cold or perhaps even chilled, although both were made from the same recipe and the same ingredients. A yeast roll, still warm from the oven, has something its twin, baked three hours earlier from the same batch of dough and kept in a warmer, can never claim. It's that final touch of perfection which makes the difference between "just food" and excellent food. You decide which it is to be by the control you exercise over the final period of production. Attempting to sidestep it by hiding behind the word "schedules" is a weak excuse. You make the choice because you are responsible, in the final analysis, for the schedules!

EQUIPMENT

Adequate equipment. You may have a stack of standardized recipes that reaches to the ceiling. You may have the best food service supervisors and cooks obtainable. They may all be enthusiastic about tested recipes. But, let them struggle along a few weeks without enough scales, measuring cups, and spoons, and your dream of quality control is certain to turn into a nightmare. Take a look around your own kitchen. Ask your cooks how many measuring spoons and cups they have. Check the scales: do they need adjusting? If the rider should be moved up to the 2.5-oz. mark on the beam to balance, you can easily understand why the cakes have been poor in volume. Are the oven thermostats accurate? When were they checked? Is it a joke in your kitchen that, in order to have a good knife or measuring cup or spoon, the employee must hide equipment for his own use? That joke may be serious enough to defeat all the other methods you use to achieve high food standards.

KEEPING UP TO DATE

Alertness to new developments in food products and procedures. One has only to keep somewhat up to date to realize that developments in the food field in the past ten years have started a small-scale revolution in our business. With food technology what it is today, progressive managers are facing the fact that the momentum of change is more likely to increase than decrease.

Some of us fight change all the way, refusing to believe that anything can compare with the "good old days." Some of us jump to new lures and bait too eagerly and get hooked for just what we are. With our professional background, it would seem reasonable to suppose we might make a more realistic approach to new things by listening, learning, testing objectively, evaluating, and accepting or rejecting on the basis of facts.

There are professional home economists and dietitians who turn up their noses at mixes, concentrates, frozen items, and dehydrated foods without making any attempt to evaluate them on the basis of their merits. Others are willing to take the time and put forth the effort to learn something about new products. It is presumptuous these days for the food service manager to assume she is a specialist in all aspects of the fast-moving industry. Surely it would be to her advantage to take the time to learn that there are organizations which will tailormake, according to her specifications, many items necessary for high quality food production. They will blend her coffee, mill her flour, freeze her fruits, and even make her soup base to order. Soup is a small item, perhaps, but it is good to know, in these days of prefabricated meats and sand-blasted soup bones, that someone can and will make you a soup base lacking that strange medicinal, tobacco-like flavor so characteristic of many on the market.

Keeping alert and open-minded is a *must* if you are not to join the covered wagon train in your progress toward better food for your customer.

UNRELAXING STANDARDS

Unrelaxing standards of quality. Never relax the standards of quality you have achieved. If the menu lists macaroni and cheese and you cannot obtain properly aged cheese to make a satisfactory product, substitute another item rather than let your food reputation slide downhill. If you approve mediocrity in quality on any occasion, you can scarcely expect your supervisors or cooks to carry on the crusade for quality alone.

Converting Home Recipes to Large Quantities

Despite all of my suggestions that many factors are more important to quality food production than changing one's recipes, there will, no doubt, be a hardy few who will still want to begin with nostalgic memories to build a recipe file. To them I give a weary nod, for I know the hard work they have in store. There probably are not too many family-size recipes which cannot be adapted for quantity food service, *provided* you have the patience and perseverance necessary to approach the problem methodically. Here let us list briefly the things you must expect to do if you wish to adapt family-size recipes for large quantity yield:

(1) Know exactly what ingredients are required in the recipe.

(2) Know the precise amounts of each ingredient required for the small-size recipe. If it calls for "a lump of butter the size of an egg" or "flavoring to taste," you must determine some measurable quantity and try the recipe out on that basis. If that doesn't give the product you want, you must start over. Needless to say, at this stage you will do well to work with family-size quantity.

(3) Know the complete mixing procedure. Proceed exactly according to the directions in making the product in small quantity. Observe carefully the product at every stage of mixing and make notes to use for checking the product development when you increase the quantity.

(4) Know the time and temperature necessary for cooking or baking the product and note them to use as a guide for large quantity production.

(5) Develop the recipe step-wise, making first only the amount of the original recipe. When the product is exactly what you want, double the quantity for the next trial. When each step yields a satisfactory product, repeat the procedure, doubling the quantity each time. This may seem a long process, but it is the only way to catch changes in quality without loss of time and ingredients. Remember to check the product during mixing to be certain that the appearance and consistency are comparable to that of the item made in small quantity. You may find the mixing time or even the baking temperature and time must be altered when you are using large institutional equipment. Keeping a careful record of each change is an important stepping stone for your next move.

(6) If the product loses the "homemade touch" you seek at a certain yield, go back a step and recheck. If, for example, you cannot satisfactorily prepare 400 portions of the product you desire, you may find it simple to obtain what you want by making the product in two batches of 200 portions each. Handling very large amounts of mixtures constituted chiefly of whipped foams of egg white, cream, or gelatins is particularly difficult. It is usually better to treat such mixtures carefully in relatively small quantities than to risk over-manipulation with the resulting loss of air. Among such delicate foods are angel food cakes, soufflés, fruit whips, chiffon fillings, and similar foods.

(7) In developing large-quantity recipes from small, it is also important that you set up the weights and measures in terms of sensible fractions. Avoid quantities which encourage guesswork rather than specific measure or weight. In designating teaspoon measurements, confine fractions to measurable amounts of ¼, ½, and ¾ and eliminate such absurdities as ⅕, ⅔, and 3/16. Dividing a tablespoon in more than two parts is also guesswork; prefer 4 tsp. to 1⅓ Tbsp. Confine cup fractions to the markings on standard measuring cups, including only ¼, ⅓, ½, ⅔, and ¾ in your recipes. In setting up weights, remember that most kitchen scales are not graduated finer than ¼-oz. for accurate weighing. Hence, in listing small weighed amounts for ingredients, avoid 1/10, 1/6, and similar small fractions; list the measured amount instead of weight of the ingredient.

In writing large-quantity recipes, avoid the clutter and confusion of such amounts as 3 qt. + 2 Tbsp. If the added small bit of material represents less than 3 to 5 per cent of the total amount of the ingredient, dropping it is not likely to cause trouble with quality. For example, the 2 Tbsp. mentioned above represents only about ½ of 1 per cent of the total amount of the liquid. The ordinary error introduced in judging the level measure or the slight offswing of a balance may often introduce errors greater than this.

With the possible exception of liquids, using weights for most ingredients is preferred to measuring in quantity production. However, in developing recipes in progressively increasing amounts, you may wish to think in terms of work simplification in making your choice between weight and measure. Is it easier to measure a cup of sugar than to weigh 8 oz.? Is it simpler to measure 2 Tbsp. baking powder than to weigh it in fractions of an ounce? Is it easier to count 4 eggs than to weigh 7 oz.? On the other hand, it may be easier to weigh 5⅓ c. sugar than to measure it. Keep work simplification in mind as you figure quantities of ingredients.

(8) Another point you may wish to consider in developing usable institutional recipes from family favorites is attention to the order in which ingredients are listed. A workable procedure lists the items in the order in which they are to be combined. Then, across from each group may be given the specific directions which apply to these ingredients. This pattern is becoming more common in family-size recipes, but many of the old favorites scrambled the order of ingredients into a confusing mixture.

(9) When you first begin to build up small recipes to large, determine what the standard portion will be. Decide early the size ladle to be used to serve Welsh rarebit; whether rolls will be 1¼, 1½, or 2 oz.; whether a two-layer, 9-in. cake will be cut in 12 or 14 pieces. These things you must know if you are to be able to build your recipes to exactly the production level you wish.

(10) Consider carefully the reliable source material at your disposal before you begin to rebuild your recipe file on the basis of "what Mother used to make." Adapt new recipes—or old—to suit the requirements of your particular food service if you wish. If you decide to work in this direction, do it methodically and carefully.

Summary

Excellent quantity food production and service are within the reach of all—with, perhaps, two exceptions. The first exception is the operator who says, "I'd like to improve the quality of our food, *but* . . ." The second exception is the top management person who, from a front office desk, says with a complacent smile, "All of our production is done on the basis of standardized recipes and procedures. We have perfect control." There is no known way to do anything to improve food quality in organizations operated by such persons. They live in a world

of their own, remembering the simple life and the apple pies Mother used to make.

Ten factors essential to quality food production have been discussed for those who do not wish to be the exceptions noted above. These elemental points are followed by an enumeration of ten steps to follow in developing small, home-size recipes into large-size for quantity production.

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BIOGRAPHICAL NOTES FROM THE HISTORY OF NUTRITION

Frederick G. Banting—November 14, 1891–February 22, 1941

Until 1921, controlled diet, which could prolong life for only a year or two, was being used for diabetes. It had been shown that diabetes followed the removal of the pancreas, and many investigators had tried to find the pancreatic secretion that would provide what was lacking in the patient. All had failed; then on July 30, 1921, a young unknown physician and a sophomore medical student isolated insulin, and Banting and Best became world famous.

Frederick Grant Banting was born on a farm in Alliston, Ontario, the son of William Thompson Banting and Sarah Grant. He was the youngest of five children. From a normal country boyhood, he went to Victoria College, Toronto (1910) to prepare for the ministry. He soon discovered the fascination of anatomy and physiology and knew that he wanted to become a surgeon. He entered the Toronto Medical School and under an accelerated wartime program graduated in 1916, joined the Canadian Army Medical Corps as captain, and saw action in France. Following the war he returned to Canada and interned at Toronto Hospital for Sick Children, after which he set up private practice in London, Ontario, but only a few patients came. He took a position as laboratory assistant in physiology at the University of West Ontario in London and while preparing for a lecture on the pancreas was stimulated to ask why it prevented diabetes. He read of the attempts to find the pancreatic secretion and thought of tying the pancreatic duct, waiting six weeks for degeneration, then removing the pancreas, and extracting the hormone. His colleagues advised him to seek help from MacLeod at Toronto but he was rebuffed.

But he was a man with an idea and would not give up. A third time he appealed to MacLeod and finally was given laboratory space and the assistance of Charles H. Best, a student in physiology and biochemistry. These two young men without funds, but with a plan and determination, began their experiments on dogs. At first failure, then try again; this time there was success with one dog, in tying off the pancreas and after six weeks being able to remove it. New techniques were devised to get results more quickly: then they took the pancreas from steers and were able to get an extract which they first called "isletin" and later, insulin. When injected into diabetic dogs, it relieved diabetic symptoms. When one diabetic dog had been kept alive seventy days and the disease had been controlled in nine dogs, they were ready to turn their discovery over to physicians for use with human beings.

Others now joined the team in purification and further testing of insulin and on January 11, 1922, a fourteen-year-old diabetic boy received injections and was restored to health, the first such case in medical history. Banting and Best though deep in debt wanted no profit from their discovery and turned it over to the University of Toronto.

Honors were showered on Banting: medals, honorary degrees, the Nobel Prize (1923) shared with MacLeod, and a knighthood from the King of England.

Banting remained a modest, hard-working investigator always giving full credit to Best for his share in the discovery. He was a vigorous person, inclined to be quick-tempered, a lover of music, and a better-than-average painter of landscapes; he traveled widely and was an omnivorous reader. In early 1941 he was preparing to go to England for some tests on a new type flying suit for the R.A.F. The bomber on which he was a passenger crashed after taking off from Newfoundland and a few hours later he died.

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—Contributed by E. Neige Todhunter, Ph.D., Dean, School of Home Economics, University of Alabama, Tuscaloosa.

Bacterial Growth in Chicken Salad[1]

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EPISODES of food poisoning continue to occur in spite of the fact that a number of recent scientific studies (1–4) have thrown much light on the essentials for control of bacterial growth in food. Many outbreaks of illness have followed banquets, church suppers, and other occasions where large quantities of food were prepared several hours prior to the time of service (5–7).

In 1948 Black and Lewis (8) studied cooling rates of several foods, presenting evidence that immediate refrigeration of cooked food was preferable to room cooling. Since that time a series of studies has been conducted at The Ohio State University to obtain additional data. Because one of the foods frequently incriminated in the literature is chicken salad, this product was chosen for our investigations. Early studies were handicapped by the fact that it was essential to keep the food safe for service to patients or in the cafeteria of the hospital. Later, funds[2] were made available so that larger quantities could be prepared, contaminated, and observed in a wide variety of situations.

PROCEDURE

Method of Preparation. A survey of several food-serving establishments revealed one pertinent variation in the method of preparation of chicken for salad. In some instances, chickens were cooked, the meat immediately removed from the bone and chopped. This chopped meat was refrigerated until the next day, then removed from the refrigerator and made into salad (Method I). In other kitchens, chickens were cooked, refrigerated until the next day, picked from the bone, and made into salad (Method II). In order to standardize the method of preparation, a comparative study was made of these two methods; as a result, Method I was adopted.

Equipment. An unused section of the Starling-Loving Cafeteria Kitchen was used for the preparation of the chicken salad. All equipment was kept separate from that in regular use in the kitchen.

In order to keep the finished product as free from contamination by unknown bacteria as possible, certain precautions were taken in addition to the usual routine of caring for kitchen equipment. Whenever possible, the equipment was washed in the mechanical dishwasher. The chopping board was first scrubbed with a brush, then put through the dishwasher. Spoons, forks, and knives were washed in hot soapy water, then held under hot running water before use. In addition, all containers used to hold cooked or other prepared ingredients were placed in flowing steam in the steam cooker for 5 to 10 min. to sanitize them completely immediately before use.

The refrigerator used for storing ingredients during the preparation period was of the ordinary walk-in type. It was being used for the refrigeration of other food prepared in the kitchen at the same time; thus the temperature did not remain constant during the day, due to opening and closing of the door by other users.

Prepreparation of Chickens. The chickens were washed thoroughly in cold water, the giblets and oil bag removed, then rinsed again in cold running water before being placed to cook in a large steam-jacketed kettle containing boiling water. Cooking was continued for 3 to 3½ hr. or until the meat was tender enough to be removed from the bones easily. The chickens were then removed from the broth to a large stainless steel pan by means of a long-handled fork. After a period of approximately 20 min., the meat was taken from the bones on a chopping board and cut into pieces of suitable size for salad with a French knife. The chopped meat was transferred to long flat pans (20 × 12 × 4), covered lightly with waxed paper, and refrigerated. The time from the

[1] Some of the data reported here are from the theses of Elva Lovett and Marguerite Kranz, presented in partial fulfillment of the requirements for the degree of Master of Science. Received for publication June 22, 1953.

[2] These studies were made possible in part by a grant in aid to the Institute of Nutrition and Food Technology, The Ohio State University, by the Poultry and Egg National Board.

end of the cooking period until the chopped meat was refrigerated ranged from 1 hr. to 1½ hr., depending on the total quantity of chicken being prepared.

The Chicken Salad. The recipe used for preparation of the salad was that published in *Food for Fifty* (9). The ingredients were kept in the same proportion, but the total amount varied from time to time according to the quantity of salad desired.

A commercial salad dressing containing egg yolk, vegetable oil, cereal, vinegar, sugar, salt, and spices was used. A commercial pickle relish containing chopped cucumbers, sugar, distilled vinegar, peppers, spices, and alum was used in place of chopped pickles recommended in the recipe. Each time salad was made, relish was taken from a newly opened can. Salt and pepper were taken from commercial containers with pour spouts.

As soon as preparation was completed, the salad was placed in covered pans to be transported to the Poultry Administration Building where the bacteriologic studies were conducted.

Inoculation and Bacteria Counts. The inoculum used in these studies was a known enterotoxin, *Micrococcus pyogenes* var. *aureus*. A known quantity of culture was added to the pans and thoroughly mixed with a stainless steel spoon which had been flamed. Although the spoons were flamed each time before mixing the salad, they were also specifically identified so that the same one was always used in the contaminated salads and another one always used to mix the control salads.

The bacterial count of the salad was made from a composite sample of salad obtained by taking a representative amount before inoculation and at stated intervals thereafter. These samples were placed in a previously tared and sterilized blending machine. After determining the size of the sample by weight, nine parts of sterile distilled water were added to make a one-to-ten dilution. A sample of the sterile water used in making each dilution series was plated to confirm its sterility. After thorough blending, the salad mixture was plated aseptically in several dilutions on glucose extract agar, each dilution being plated in duplicate. The count recorded was an average of the duplicate plates. This agar was selected for the total bacterial count inasmuch as it is not inhibitory to any bacteria.

To count the Staphylococci present, 1 cc. of the same diluted salad mixture was plated in duplicate on Difco 7.5 per cent salt phenol red mannitol agar. This agar is an inhibitor of all bacteria except Staphylococci. On these plates only those colonies showing the golden yellow pigment of the aureus variety were counted. The plates were incubated at 37°C. for 48 hr. and the colonies counted. The bacterial counts were charted as logs of the arithmetical count.

pH Determinations. A Leeds Northrup *pH* meter was used to determine the *pH* of the chicken salad. The instrument was checked against a buffer solution before each series of readings, and the beaker used was always rinsed with distilled water before adding the sample.

Temperature Recordings and Interpretations. Salad and ingredient temperatures were recorded by use

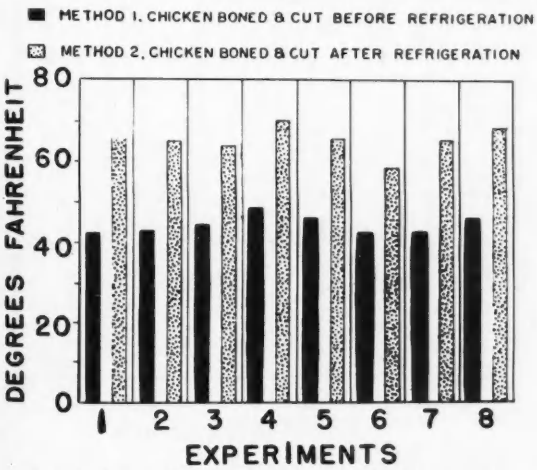

FIG. 1. *Comparison of the internal temperatures of cut chicken prepared by Methods I and II when ready to be mixed with salad ingredients*

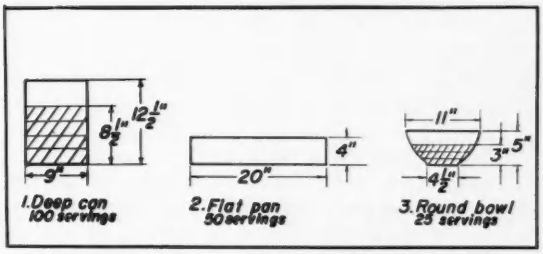

FIG. 2. *The three containers used for the storage of chicken salad*

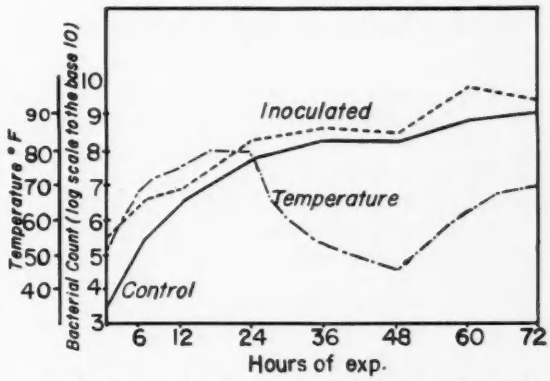

FIG. 3. *Temperature changes and bacterial counts of 100 servings of chicken salad (deep can) stored for 24 hr. at room temperature, 24 hr. in refrigerator, and returned to room temperature*

of a Leeds Northrup Mixromax (thermocouple) inserted into the center of the mass. In most instances, the temperatures of the salad and the room were recorded continuously. For the purpose of clarity, the temperatures between 50° and 120°F. were accepted incubation temperatures, although it is recognized that 50°F. is not favorable for the growth of many bacteria. For practical purposes, we assumed a temperature below 50°F. to be inhibitory and have used this point to indicate the beginning or the end of the "incubation zone."

RESULTS

Preliminary Study

When the chicken was cut immediately after cooking and the cut chicken refrigerated and made into salad the next day (Method I), the temperature of the salad was more satisfactorily maintained than when the whole cooked chickens were chilled and the meat removed from the bone just before making into salad (*Fig. 1*). There was a certain amount of unavoidable contamination during the boning and cutting, but when the cut chicken was refrigerated, these bacterial counts diminished. The bacterial counts 2 hr. after making the salad paralleled the temperature curves.

Throughout the series of experiments, Method I as described above was followed.

Cooling Curves

Earlier studies (8) had demonstrated that food cooled more rapidly and more completely at refrigerator temperature than at room temperatures. However, the time required for a quantity of chicken salad to cool to below incubation temperature in the refrigerator and to warm up when again moved into the room was rather dramatically illustrated by several of the temperature curves obtained during the progress of these studies.

Data on cooling and warming curves were obtained on three different quantities of salad—100 servings, 50 servings, and 25 servings—and in three different containers—a deep can, a flat pan, and a round bowl. (*Fig. 2*). Temperature curves are illustrated in Figures 3, 4, 5, and 6.

Figure 3 illustrates the temperature changes in the 100-serving quantity of salad. At the end of the production period, the salad temperature was 52°F. When left in the room, about 6 hr. elapsed before the temperature rose to 70°F.; it had risen to 78°F. before finally being refrigerated. Nine hr. elapsed before the internal temperature had fallen below 50°F. after placing this large can of 78°F. salad in the refrigerator. When this deep kettle of salad, now registering 46°F., was removed from the refrigerator and placed at room temperature, the internal temperature rose to 50°F. in about 3 hr., to 60°F. in 9 hr., and to 70°F. in a little over 12 hr.

The 50-serving quantity, placed in the flat pan, registered 56°F. at the end of the preparation period and warmed to 68°F. in 4 hr. The temperature fell to 50°F. in a little less than 6 hr. when this pan was placed in the refrigerator. After the 40°F. salad was returned to the room, the temperature rose to 50°F. in about 5 hr. (*Fig. 4*).

A quantity of salad equivalent to 25 servings was prepared from coarsely ground chicken as for chicken salad sandwiches. This quantity was placed in a bowl, and the temperature registered 60°F. on completion. During the 6 hr. in the warm room, the internal temperature of the salad rose to 78°F., and after the bowl of 78°F. salad was refrigerated, 3 hr. elapsed before the temperature fell below 50°F. When the bowl of 40°F. salad was placed in the room, it rose to 50°F. in 2 hr. and to 70°F. in approximately 5 hr. (*Fig. 5 and 6*).

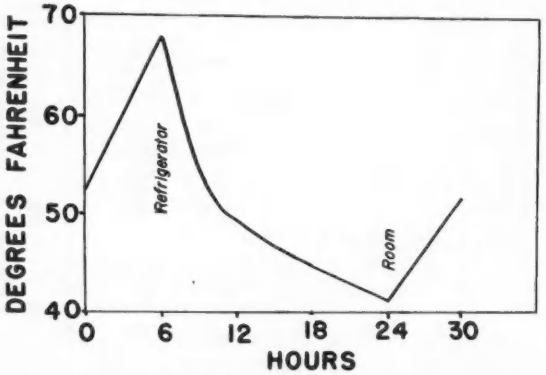

FIG. 4. *Temperature changes of chicken salad (50 servings in flat pan)*

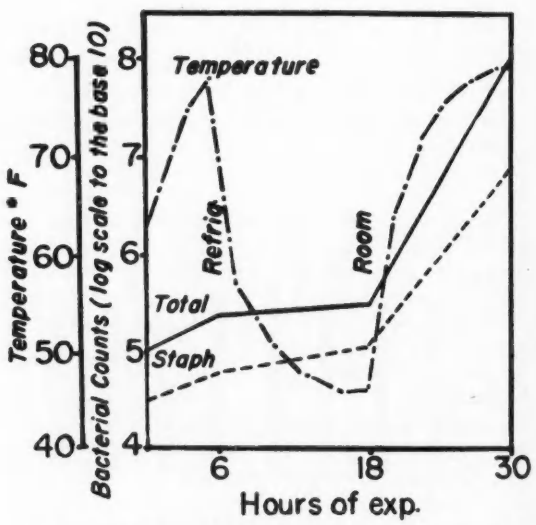

FIG. 5. *Temperature changes and bacterial counts of 25 servings of ground chicken salad (round bowl) stored at room temperature for 6 hr., refrigerated overnight, and returned to room temperature*

BACTERIAL COUNTS

Study I. The bacterial counts of the 100-serving quantities of chicken salad in the deep can are illustrated graphically in Figure 3. One can was inoculated with *Micrococcus pyogenes* var. *aureus* and the other kept as a control; both remained in the room 24 hr., were refrigerated for 24 hr., and then were returned to the warm room.

While the original counts from the inoculated and control samples differed, the bacterial growth curves were strikingly parallel. Growth during the initial 24 hr. in the room was rapid and according to the expected pattern. The failure to find a corresponding decrease on 24-hr. refrigeration can perhaps be explained by a study of the cooling of the salad (*Fig. 3*). Although the salad was in the refrigerator 24 hr., it was still above a temperature inhibitory to bacterial growth for at least the first 9 hr. of this period. Whatever increases may have taken place at this time are not evidenced in the records because samples were not taken until the end of the 12-hr. period. The total count increased slightly during the first 12 hr., and decreased slightly during the second 12 hr. On being removed to the warm room, the bacterial count increased rapidly.

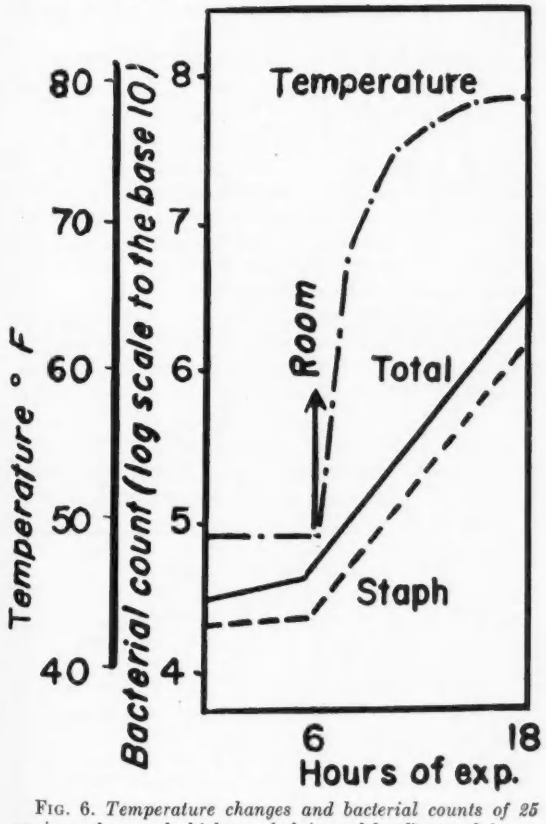

FIG. 6. *Temperature changes and bacterial counts of 25 servings of ground chicken salad (round bowl) stored in refrigerator for 6 hr. and then placed in room temperature*

Study II. Chicken salad equivalent to 200 servings was prepared and divided into four equal quantities. Two were inoculated with *Micrococcus pyogenes* var. *aureus* and two kept as controls. One inoculated and one control sample remained in the warm room for the duration of the study, and two similar amounts were placed in the refrigerator.

In both instances the total count and the Staphylococcus count of the control samples produced curves which followed the generally accepted normal bacterial growth curve. Increases in bacteria proceeded slowly for a few hours (the lag phase), then there was a period of rapid increase reaching a peak and leveling off for a time. This peak of growth was followed first by a slow decline and then a rather rapid drop in numbers of active bacteria (*Fig. 7 and 8*).

As in Study I, it was interesting to note that while there was a considerable initial difference in the number of bacteria present in the various quantities of salad, after 48 hr. at room temperature, the number of organisms in the inoculated and control pans was practically the same. When the salad remained in the refrigerator, there was practically no increase in the number of active bacteria.

Study III. Study III concerned chicken salad prepared for sandwiches. An amount equivalent to that needed for 25 sandwiches was placed in each of 4 bowls, similar to that illustrated in Figure 2. Since the uninoculated salads had demonstrated a bacterial growth practically as great as that of inoculated samples, no inoculum was added. The mixtures were studied under the following conditions: (a) kept at room temperature 6 hr. (to represent a serving period) and then refrigerated and (b) refrigerated for 6 hr. to chill the spread thoroughly, then returned to the room as though for service. The bacterial growth curves are given in Figures 5 and 6. The bacterial growth was well started during the first 6 hr. at room temperature, growth was held to a minimum during refrigeration, but flourished when the salad was again placed in the warm room (*Fig. 5*). In the second observation (*Fig. 6*), there was practically no increase in bacteria during initial refrigeration but rapid growth thereafter. These results are interpreted to indicate that chicken salad sandwiches stored on cafeteria counters during the serving hours are potentially dangerous.

pH Determinations

The recordings of *p*H observed in these investigations fell between 4.1 and 6.3, although in all instances when rapid growth was not taking place, it was rather stable at about 5.5. A typical curve is presented in Figure 9. When the salad remained in the warm room, bacterial growth was as expected (*Fig. 7 and 8*), and the *p*H decreased steadily from 5.65 to 4.10. After 36 hr., a definite physical change could be noted in the salad. The salad dressing seemed to have broken down, and some clear liquid

collected in the bottom of the container. In the refrigerated sample, however, no evidence of deterioration was apparent even after 72 hr.

COMMENT

While refrigeration is a very efficient means of controlling bacterial growth, it may lead to a false sense of security unless other vitally important factors are considered. The internal temperature of the food itself must be brought below the incubation zone before growth is inhibited. Even though food is under refrigeration, it is potentially dangerous depending on: (a) the size and depth of the amount to be cooled, (b) the temperature of the food at the time of storage, and (c) the cooling power of the refrigerator as determined by the circulation of air and efficiency of the refrigeration mechanism.

Studies to evaluate the potential danger of cooked foods are handicapped by the fact that there is at present no satisfactory method for determining quickly the presence of enterotoxin in the food. Since it is the toxin and not the organism which is the causative agent in this type of food poisoning, and since bacterial growth can take place without the production of enterotoxin, it is impossible to interpret findings of this type properly. It seems advisable, however, lacking any other more adequate criterion than rapid reproduction of bacteria, to consider all such products where handling is an essential in their preparation for consumption as potentially dangerous, and to maintain conditions which will render bacterial growth practically impossible.

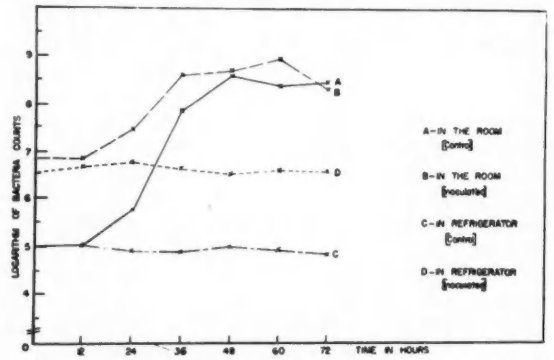

FIG. 7. *Total bacterial counts of inoculated and control salads held continuously at room and refrigerator temperatures (50 servings, flat pan)*

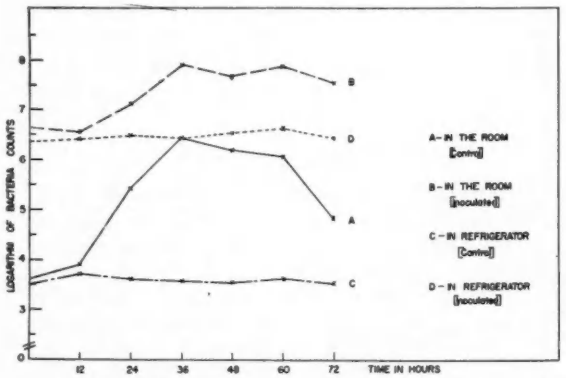

FIG. 8. *Staphylococcus counts of inoculated and control salads held continuously at room and refrigerator temperatures (50 servings, flat pan)*

SUMMARY

Cooling curves are presented which illustrate the time required for a quantity of warm chicken salad to cool to a temperature incompatible with bacterial growth even though the salad had been placed in the refrigerator. The time required for cooling was related to the quantity of salad and the shape of the container (9 hr. for the large quantity in a deep container to 3 hr. for the smaller quantity in a shallow bowl).

Bacterial growth curves illustrate the fact that microorganisms grow rapidly when conditions favorable for growth are available. In any change of environment, there was an initial "lag" in the increase or decrease of reproduction. This lag serves as a safety factor when cold food is brought into the warm room, but is a potential danger when warm food is refrigerated in a large mass.

The amount of handling involved in the preparation of chicken salad insures a certain degree of bacterial contamination. Under satisfactory conditions of temperature, this amount of inoculum resulted in a final bacterial count as great as when a large amount of inoculum had been added to the original sample. These data indicate the danger of even a small amount of contamination since the amount of contamination had no relation to the bacterial count taken several hours later.

Chicken salad kept below 50°F. evidenced practically no increase in numbers of active bacteria present even after 72 hr. of refrigeration. This serves to emphasize the importance of cold in assuring safe food service of such a product as chicken salad.

Where chicken salad is prepared in large quantities, it should be stored in thin layers in flat pans, and every effort should be made to maintain a tem-

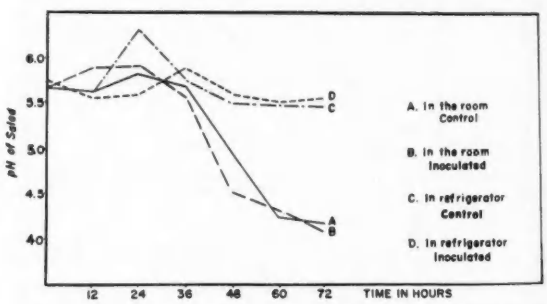
pH of Salad
TIME IN HOURS
A. In the room Control
B. In the room Inoculated
C. In refrigerator Control
D. In refrigerator Inoculated

FIG. 9. *The pH of inoculated and control salads held continuously at room and refrigerature temperatures*

perature not far above 50°F. for the entire life of the salad.

Evidence of the potential danger inherent in storing chicken salad sandwiches on a cafeteria counter was presented.

The *p*H of the freshly prepared salad was approximately 5.5. Under refrigeration (no bacterial growth), there was essentially no change in *p*H. Salad in the warm room (rapid bacterial growth) evidenced a drop in *p*H to 4.10 after several hours.

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Second World Food Survey

How much food does the world have to eat? How far does it go to feed the world population? What are the prospects for more food in the next ten years? The Food and Agriculture Organization of the United Nations seeks to answer these questions in its *Second World Food Survey*, which states that there is "no ground for complacency."

The present *Survey* is a sequel to the original *World Food Survey* published in 1946, which was concerned with the situation to the immediate postwar years; the present one deals with the intervening period and the present situation, and then considers what must be done to improve it.

The world food supply reached its lowest ebb during 1946–47; since then there has been a gradual but uneven recovery. In the highly developed countries of Western Europe, for example, it has been rapid, but it has been slowest in regions where the situation remains the worst and where population increases have been greatest—parts of South America and, more particularly, Southeast Asia.

In Western Europe, for example, by 1950–51, agricultural production was more than 10 per cent above prewar figures, with output of livestock products not far behind. In Germany and Austria, however, the division of the countries into different zones of occupation and many other political and economic factors delayed recovery. Southern and eastern European countries have suffered frequent chronic food shortages.

In the Far East, the whole postwar period has been marked by serious political disturbances which have greatly impeded recovery. Average production of rice in 1949–50 was still 2.5 per cent below prewar levels, while the estimated increase in population was more than 10 per cent. Since rice normally provides about 70 per cent of the food supply for the Far East, the continuing shortage is a matter of grave concern.

In Latin America, apart from rice and one or two other crops, there is little sign of a significant upward trend in yields. In the main, except for Argentina where production is greatly below prewar, increased output has come from expanding the areas under cultivation. The exploitation of the region's potentialities, however, is gradually increasing.

Despite large postwar harvests in the surplus areas of North America and Oceania, world production per person has reached prewar levels for only a few major commodities.

Regarding the nutritional quality of the diets, the *Survey* reveals that "even in countries in which caloric levels are adequate, diets often do not contain enough 'protective' foods." The serious effects of such unbalanced diets on the health of the people, FAO says, are indicated by the prevalence of nutritional deficiency diseases in many parts of the world.

Nutritional "targets" for 1960, worked out on a basis which allows for human requirements under the different conditions in various parts of the world, are set forth. These estimates consider anticipated increase in population and requirements for supporting increased numbers of livestock. Success in achieving these goals depends on continued and accelerated development along present lines in the technical, educational, and administrative fields; the absence of any world war or similar catastrophe; greater liberalization of international trade; and increased integration of national and international food production programs at all levels.

Hospital Relations with Labor Unions[1]

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THIS subject, if presented at a meeting of hospitals twenty-five years ago, would have been entirely academic, but with the development of labor unions in the hospital field, it becomes vital as a matter to be discussed and, more important, understood.

With 6,637 registered hospitals in the United States with a total bed capacity in excess of 1,500,000, it is evident that hospitals are one of the nation's larger employers of labor. With the pattern having been established by employees in industry as to their desire to unionize, it is natural that employees of hospitals also desire to organize.

The United States labor force on July 12, 1952, totaled 64,176,000 men and women with more than 7,000,000 employed in agriculture. Estimates by the United States Department of Labor of union membership during 1951 place the number at 14,000,000 to 16,800,000. This represents a relatively high membership when one considers the problems involved in the organization of agricultural workers, domestic workers, and employees in small communities. An examination of the union membership trends has shown a continuous increase for the past several years. Hospital employees are merely a part of the trend toward unionization.

The term "collective bargaining," as it is used today, suggests specific reference to labor negotiations. Actually, this method as a dynamic process for the meeting of minds is nothing new. The principles involved concern the use of a few selected individuals to obtain a favorable contract or decision for the larger group that they represent. Collective bargaining principles are applied when a group of trustees of a church, for example, representing a larger number of individuals, negotiates a loan with a bank on as favorable terms as possible. The trustees in this instance represent the congregation, and the bank officers represent the Board of Directors and stockholders. Today, the influence and concerted action of the number of individuals represented by unions have placed labor in a more advantageous position at the conference table.

Labor and labor leaders assume a greater responsibility for community health when, by their organization, they become a more influential force in the policies of a hospital. Hospitals remain a cooperative effort of all who participate in its operation and in the giving of patient care. Communities will not long tolerate indifference and idleness on the part of those to whom they have assigned the responsibility for this service. With the more important role assumed by labor, the community must now look to both labor and management for the kind of institution they are willing to support.

There is every reason to believe that, after the relationship between unions and hospitals has become more stabilized, labor may be expected to assume a constructive role in maintaining good work standards that insure ultimate benefit to patients.

PROFESSIONAL GROUPS IN THE LABOR MOVEMENT

The American Nurses Association was the first among the professional groups of the hospital to organize as collective bargaining units in addition to maintaining its objectives as an association of professional people interested in standards, professional development of its members, and research in the field of nursing techniques, administration, and allied interests.

In 1937 the American Nurses Association announced that it did not "recommend nurses' membership in unions" because in the opinion of that organization the nurses had in the professional organization an instrument better fitted and equipped to improve every phase of their working and professional lives. This policy, however, urged that state associations assume their responsibility for standards of nursing care and *employment conditions* for nurses. The Association also urged the acceptance of minimum wage and hour standards which it published.

As early as 1941, the nurses in the industrial centers of California, being faced with rising living costs and shortages of personnel, demanded a stronger bargaining program. The hospitals were unable to raise wages in the amounts demanded by the nurses' association. As a result, some nurses turned to unionization.

After successfully representing the nurses before

[1] Presented before the 6th Annual Midwest Hospital Conference in Minneapolis, on May 14, 1953.

the National War Labor Board and obtaining a 15 per cent wage increase according to the Little Steel formula following the wage freeze of 1942, the California Nurses Association received an overwhelmingly affirmative response from its members to represent them in future collective bargaining agreements. This plan of collective bargaining by a state nurses' association has since been followed in other states.

UNIONIZATION OF NONPROFESSIONAL WORKERS

The so-called nonprofessional worker has been more easily absorbed into existing labor unions. Building and service employees of private industry are a well-established component of organized labor. The inclusion of the large number of such hospital employees into unions represented primarily an organizational job not dissimilar from the organizational programs used in other nonunion employment areas.

There are no indications that the unionization of hospital workers will diminish, and there are many indications of an acceleration in membership of hospital unions, with a corresponding increase in the influence of unions on hospital-employee relationships.

With this situation in mind it appears to be a basic necessity that hospitals, to accomplish the job of caring for the sick, must learn methods which will insure the cooperation of organized labor—not only in the performance of the task to which the employee is assigned but also to gain for the hospital the loyal support for its program that is so essential in such a personalized service.

AGREEMENTS AND INDIVIDUAL WORKERS

The negotiations, conferences, and agreements are but a part of the hospital relationship with a union. The day-to-day application of those agreements to the individual worker is the human side of that relationship and does not differ fundamentally from good personnel practices. The problem of hospital relationships with unions remains, namely, to give each employee job satisfactions and reasons for the development of effectiveness on the job and loyalty to the hospital. This must all be accomplished in a highly complicated social and economic setting of which the hospital is only a part, because certainly there are many factors influencing a worker's job satisfaction. These include his own health and the health of his family, housing, domestic problems, and the other social factors. His response to work and supervision at the hospital is correspondingly influenced by them.

Most crucial to hospital relationships with employees is the perception by hospital management that each worker is a social being. I think it would be a mistake to assume that unionism has its appeal only because it offers prospects of greater economic security. In bargaining for recognition, the union members also want to be recognized as individuals and respected as such, actuated by the authentic American ambition to be somebody. This primacy of the person is not only the philosophic tenet of democracy, it is the core of successful hospital-employee relationships. The individual who believes that exercise of his skill—and everyone uses some on any job—is not recognized for its full worth is without social function at his job. His work is a void; what he does to earn a living lacks point and direction. Even on the economic plane, the worker is often as concerned with the relation of his wages to those received by others as with the absolute amount he may earn. Each worker wishes an arrangement which offers more than an opportunity to put in an 8-hr. day so that he and his family may eat regularly. He desires the kind of security that is rooted in steady employment, year in and year out; a chance for advancement; treatment from a hospital supervisor and associates that causes him to believe that he has a personal stake in the success of the hospital; and maintenance of his sense of dignity which comes from the assurance that what he contributes is going to be justly evaluated and appreciated.

Hospitals, like other employers, have relied on certain implied rights under common law—the concept of master and man and the owner-of-the-premises theory. This point of view has been considerably altered or modified with the introduction of unions in the hospital field. As with any new development, there are painful periods of growth. This change requires a complete restudy of hospital-employee relationships.

Both labor and management have a vital interest in the intelligent and positive solution of this problem. Unions and labor need a successful hospital management if for no other reason than the continuance of the hospitals as an employer of labor. Labor, I am sure, also recognizes the necessity of a hospital as a community institution of which it is a part.

NEED FOR TRAINING PROGRAMS

There probably are few irritants to an employee quite so severe as in those situations when the employee is not completely informed as to what is expected of him. Good employee relationships can only be developed if each new employee is fully advised of his duties. The mere listing of jobs is not sufficient; a planned program of preservice training which orients the employee to hospital policies, functions, and methods of work, together with adequate supervision, is necessary if the worker desiring to succeed is to do so. Such a program should also include provision for in-service training to insure continuity of satisfactory job performances and improvement in work methods.

The need for this kind of program exists for all

types of employees regardless of the professional job content or skills required. There are even right and wrong ways to mop a hospital floor. The employee can reasonably expect to be shown the proper way to perform this manual task.

GRIEVANCES

Employees do not change basically when they become members of a union. There are, however, evidences that grievances seem to be more frequent and often more insistent than before unionization of the hospital or with existing nonunion groups. Although the settlement of grievances is time-consuming and often places a heavy tax on patience, such experiences can be used constructively in hospital-employee relationships. The fact that employees have an avenue by which they can express their views in a more impersonal way through their representatives means that minor discontents and dissatisfactions become known to management, rather than lying dormant to fester the morale of the worker. The mere discussion of the problem is wholesome, even though its solution cannot always be resolved to the complete satisfaction of the employee. This channel for the presentation of grievances also provides management with the opportunity to interpret the basis for administrative decisions which affect the hospital worker.

The very existence of employee organization makes possible another constructive use of the organization in matters of community interest that may not be directly related to hospital operation. Labor unions have given support to Community Chests, Red Cross blood drives, war bonds, and other activities. The organized employees have an immediate means for the accomplishment of concerted action in the support of these civic projects. Management can look more and more to the democratically chosen leaders of hospital employees to assume a greater responsibility for these community services as unions gain status and recognition.

The inevitability of the present trend in the unionization of hospital workers imposes on both management and labor the responsibility of developing a relationship that will provide for the patient a high quality of hospital service at a cost consistent with the value of these services in relation to costs in the community.

How Should Prescriptions for Low-Sodium Diets Be Ordered?

At a Diet Therapy Workshop for dietitians and nutritionists of the U. S. Public Health Service held in March, Marjorie Cantoni, Division of Chronic Disease and Tuberculosis, led an informal discussion on the practical aspects of low-sodium diets. In discussing terminology for prescriptions, the following points were emphasized.

(a) Physicians should be encouraged to order the number of milligrams of sodium that would be most beneficial to the patient, for example: 200, 400, and 800 mg. sodium per day.
In Newton, Massachusetts, local physicians have decided on the following levels of sodium, each of which may be combined with 1200, 1500, or 2000 calories: 200 mg. for hypertensive patients who may be benefited by dietary treatment; 400 mg. for treatment of congestive heart failure; and 800 mg. when less rigid sodium restriction is desired. Other hospitals and clinics use different levels, such as 200, 500, and 1000 mg. The American Heart Association booklet, *Food for Your Heart*, describes the following sodium levels: under 500 mg.; 500–1500 mg.; and 1500–3000 mg.

(b) Terms such as "low-salt," "salt-free," or "salt-poor," should be discouraged. They mean the dietitian must call the physician to learn exactly what is wanted.
Why do we want to encourage the use of "low-sodium" diets rather than "low-salt"? Low-sodium means not only the restriction of salt, but also baking soda, regular baking powder, and food products containing sodium compounds. Also, some foods—such as protein foods and some vegetables—have high sodium contents and must be limited.

Another topic dealt with the question: *How can we make low-sodium diets as nutritionally adequate as possible in protein, vitamins, and minerals?* It was pointed out that hospital house diets should be and can be the basis for planning low-sodium diets, with a few practical considerations, such as the following:

(a) Meats and vegetables can be cooked without salt. Try other seasonings, such as pepper, paprika, garlic, onion, herbs, and so forth, to add flavor.

(b) Good quality, low-sodium bread can either be prepared by hospital bakers or purchased commercially.

(c) Fruit makes an acceptable dessert, adding variety the year-round. However, if there are adequate facilities, cakes, pies, cookies, puddings, and so on, can be made without added sodium chloride and with sodium-free baking powder.

Diet and Amino Acid Utilization in Gastrointestinal Disorders[1]

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INCREASING emphasis on the importance of adequate dietary protein, and its component amino acids, in the treatment of disease justifies a review of the findings on the utilization of amino acids in gastrointestinal disease. Studies of patients with peptic ulcer (1) and with ulcerative colitis and regional enteritis (2) compared with healthy subjects (3) revealed essentially normal utilization of amino acids. Since patients with gastrointestinal disease can effectively utilize good quality protein, a definite dietary plan to include at least 1 gm., preferably more, of protein per kilogram body weight seems desirable.

A comparative analysis of the utilization of various protein supplements, i.e., skim milk powder, evaporated milk, and protein hydrolysate, to replace the protein of meat and egg in the diet indicated that the whole protein of the milks was assimilated normally by these patients. The use of hydrolyzed protein is unnecessary, and it may be contraindicated, especially in ulcerative colitis (4).

METHODS OF STUDY

The methods of study are described in detail in previous publications. Amino acid excretion in urine (5) and in feces (6) was determined first in two normal subjects. Amino acid levels in plasma and the urinary excretion of amino acids were measured during the administration of diets of varying protein content (3). Comparative studies subsequently were made of four patients with peptic ulcer (1), three patients with chronic ulcerative colitis, and one with regional enteritis (2). The utilization of whole proteins as compared with hydrolyzed protein also was investigated (4).

The eight amino acids measured microbiologically in the food, plasma, and six-day collections of urine and feces were: leucine, isoleucine, valine, threonine, arginine, histidine, lysine, and methionine. Conventional nitrogen balances also were obtained.

Constant weighed diets were used throughout the studies. The over-all dietary plan was to provide 1 gm. protein per kilogram body weight, with sufficient calories to maintain body weight. A liquid vitamin B preparation was given daily. The foods were selected from accepted lists for: (a) the disease and (b) the quantitative procedure followed in the metabolic research unit. The meal pattern was adapted to the needs of the individual patient. When additional protein (approximately 0.2 gm. per kilogram) was fed, the diet was kept isocaloric.

The quantity and quality of the food were kept as uniform as possible from day to day during the respective collection periods. The same food items were used for the comparative studies. For each individual, the amounts of food were adjusted to furnish the same percentage of protein, and its component amino acids, per kilogram body weight from the same items.

The meat consisted of ground beef round, carefully broiled as uniformly as possible throughout. The egg was thoroughly beaten and weighed into a heated cast aluminum skillet for cooking in a small amount of butterfat.

In studying the comparative utilization of various whole proteins and one hydrolyzed protein, the supplements, i.e., skim milk powder, evaporated milk, and protein hydrolysate, were administered in quantities to replace exactly the protein nitrogen of the meat and egg employed in the diet during the other periods of study. Adjustments in carbohydrate and fat were made to keep the diets isocaloric. For amino acid and nitrogen analysis, 30 to 40 per cent aliquots of the daily intake of food (except pure carbohydrate and butterfat) were weighed into a Waring Blendor and homogenized with distilled water.

Three-day transitional periods preceding the re-

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spective collection periods permitted adjustment to the different diets. Urine and feces then were collected for six-day balance periods. Carmine markers were used for the feces collections.

The total quantity of each of the eight amino acids was determined in acid-hydrolyzed samples of food, urine, and feces. Total nitrogen was determined also. In plasma, the fasting levels of the free amino acids and the total non-protein amino acids were determined as well as the amino acid content of the whole plasma.

RESULTS

In the normal control subjects, the nitrogen balances were slightly positive. The excretion of amino acids in the urine was small (3). For the eight amino acids studied, the average amount excreted in the urine was 2.5 per cent of intake. The pattern of the relative rates of excretion of the individual amino acids was not correlated with varying intake of the respective amino acids, except for histidine and threonine which fluctuated slightly.

Of the eight amino acids determined in whole plasma, the methionine content paralleled varying intake, but for the other seven, there was no direct correlation. The individual free amino acids in plasma fluctuated slightly, but they did not parallel varying intake. Seven amino acids were consistently present in combined, non-precipitable form, and these did not vary in relation to intake. Combined methionine was present only in minute quantity or was totally absent.

As compared with the normal subjects, the nitrogen balance and the output of urea nitrogen of the four patients with peptic ulcer (1) were similar. These data are summarized in Tables 1 and 2. The excretion of amino acids in urine and feces was similar for the two groups, except that the output of histidine was smaller for the ulcer group. The differences in the free amino acids in plasma were small. The concentration of each of the eight non-protein amino acids was increased in the ulcer group.

Of the patients with ulcerative colitis and regional enteritis (2), two with ulcerative colitis were in ap-

TABLE 1*

Total excretion of eight amino acids in urine and feces of three normal subjects and four patients with peptic ulcer

AMINO ACID	AMOUNT INGESTED	AMINO ACIDS IN URINE				AMINO ACIDS IN FECES			
		Normal subjects		Peptic ulcer patients		Normal subjects		Peptic ulcer patients	
		Average	Range	Average	Range	Average	Range	Average	Range
	mg./sq. m./day	*mg./sq. m./day*	*mg./sq. m./day*	*mg./sq. m./day*	*mg./sq. m./day*	*mg./sq. m./day*	*mg./sq. m./day*	*mg./sq. m./day*	*mg./sq. m./day*
Leucine	3150	12	6– 13	13	8–18	150	130–170	180	150–220
Isoleucine	2130	7	3– 8	10	8–15	120	100–130	120	100–150
Valine	2200	10	8– 13	15	10–22	150	130–170	170	130–180
Threonine	1530	32	28– 38	25	18–22	140	130–150	120	80–150
Arginine	2000	12	6– 15	17	13–22	120	70–150	130	100–170
Histidine	1050	117	72–187	55	37–70	64	50– 70	50	30– 80
Lysine	2600	50	33– 75	45	30–65	180	150–220	200	170–280
Methionine	900	5	2– 7	5	3– 7	50	20– 70	70	50– 80

* Reprinted with permission from the *Journal of Clinical Investigation* (1).

TABLE 2*

Concentrations of eight amino acids in plasma of three normal individuals and four patients with peptic ulcer

AMINO ACID	FREE AMINO ACIDS IN PLASMA				TOTAL NON-PROTEIN AMINO ACIDS IN TUNGSTIC ACID FILTRATES OF PLASMA			
	Normal subjects		Peptic ulcer patients		Normal subjects		Peptic ulcer patients	
	Average	Range	Average	Range	Average	Range	Average	Range
	mcg./cc.	*mcg./cc.*	*mcg./cc.*	*mcg./cc.*	*mcg./cc.*	*mcg./cc.*	*mcg./cc.*	*mcg./cc.*
Leucine	29	20–40	19	18–21	48	43–52	80	64–104
Isoleucine	18	17–20	15	13–18	32	28–37	49	44– 55
Valine	28	20–39	32	26–37	42	39–47	74	61–100
Threonine	27	19–42	15	10–19	45	37–54	63	36– 88
Arginine	17	15–19	29	26–35	33	27–44	77	50– 95
Histidine	16	12–21	14	12–15	24	22–28	30	23– 38
Lysine	26	24–28	36	22–47	52	39–69	88	42–107
Methionine	6	5– 7	5	3– 6	6	5– 7	10	5– 14

* Reprinted with permission from the *Journal of Clinical Investigation* (1).

proximate nitrogen equilibrium. In one patient with severe ulcerative colitis and in the one person with regional enteritis, the nitrogen balance was slightly negative. The output of urea nitrogen was normal in two cases and diminished in two. The fecal excretion of nitrogen consistently exceeded that in the normal subjects or in the patients with peptic ulcer.

The data for these patients are summarized in Tables 3 and 4. The free amino acids in plasma were approximately the same in the colitis-enteritis patients as in the normal subjects. In two of the three patients with ulcerative colitis and in the subject with regional enteritis, the total non-protein amino acids in plasma were definitely higher than normal. In the one patient for whom the non-protein amino acid values were slightly below normal, the colitis was quiescent at the time of the study. The patient for whom significant increases were noted in all eight amino acids had the most severe colitis. Thus the concentration of non-protein amino acids in the plasma seemed to correspond to the severity of the disease.

The urinary excretion of amino acids was within normal range. The fecal excretion of amino acids was increased in all four colitis-enteritis patients, significantly so in three. The highest outputs were noted in the patient with the most severe colitis. The patterns of excretion were similar in both the patients and the normal subjects.

When two of the patients with ulcerative colitis received additional protein, they excreted 73 per cent of the supplemental nitrogen as urinary urea and ammonia and 3 per cent in the feces; they apparently retained 24 per cent of the additional nitrogen. Microbiologic determinations indicated that the additional protein contained 21 per cent more of the

TABLE 3*

Amino acid concentrations in plasma of patients with chronic ulcerative colitis or regional enteritis

AMINO ACID	FREE AMINO ACIDS IN PLASMA					TOTAL NON-PROTEIN AMINO ACIDS IN PLASMA				
	Ulcerative colitis patients				Regional enteritis patient—Subject H. C.	Ulcerative colitis patients				Regional enteritis patient—Subject H. C.
	Subject G. B.	Subject J. P.	Subject M. U.	Average		Subject G. B.	Subject J. P.	Subject M. U.	Average	
	mcg./cc.				*mcg./cc.*	*mcg./cc.*				*mcg./cc.*
Leucine	21	21	14	19	30	29	64	93	62	73
Isoleucine	11	13	21	15	16	15	31	64	37	33
Valine	29	30	23	27	35	36	56	63	52	51
Threonine	15	15	11	14	19	19	49	72	47	49
Arginine	20	29	20	23	20	19	67	88	58	51
Histidine	15	13	14	14	12	13	23	30	22	21
Lysine	20	32	29	27	35	25	84	91	67	81
Methionine	—	5	7	6	4	—	7	15	11	8

* Reprinted with permission from the *Journal of Clinical Investigation* (2). Blood drawn simultaneously with close of metabolic period after an overnight fast.

TABLE 4*

Excretion of amino acids in urine and feces of patients with chronic ulcerative colitis or regional enteritis

AMINO ACID	AMINO ACIDS IN URINE					AMINO ACIDS IN FECES				
	Ulcerative colitis patients				Regional enteritis patient—Subject H. C.	Ulcerative colitis patients				Regional enteritis patient—Subject H. C.
	Subject G. B.	Subject J. P.	Subject M. U.	Average		Subject G. B.	Subject J. P.	Subject M. U.	Average	
	mg./sq. m./day				*mg./sq. m./day*	*mg./sq. m./day*				*mg./sq. m./day*
Leucine	10	20	9	13	23	290	670	2,410	1,123	545
Isoleucine	5	8	6	6	12	190	430	910	510	315
Valine	7	20	12	13	17	200	580	1,470	750	458
Threonine	22	26	22	23	33	180	410	1,680	757	328
Arginine	14	17	17	16	25	160	490	1,620	757	328
Histidine	87	79	52	73	88	90	250	810	383	210
Lysine	48	68	42	53	67	290	680	2,560	1,177	536
Methionine	3	8	2	4	8	70	170	340	193	216
Total.....	196	246	162	201	273	1,470	3,680	11,800	5,650	2,936

* Reprinted with permission from the *Journal of Clinical Investigation* (2).

eight amino acids than did the basal diet. The output of these amino acids in the feces was increased only 4 per cent, a negligible increase.

In the study to determine the relative value of certain proteins as dietary supplements in gastrointestinal disease, the nitrogen balances in the patients with gastric ulcer were positive, with more nitrogen retained during the ingestion of the two milk proteins (4). In the patients with ulcerative colitis, the nitrogen balance was definitely negative only during the period on protein hydrolysate. The data for the urinary excretion of amino acids are summarized in Table 5, with the results averaged for each group since there were no significant differences. The trends of amino acid excretion in the urine were the same for the gastric ulcer and ulcerative colitis groups and for the control subjects. The urinary excretion of leucine, isoleucine, valine, threonine, and methionine did not vary appreciably except when the protein hydrolysate was given. The excretion of arginine and lysine increased significantly on both protein hydrolysate and evaporated milk in the normal subjects and in the patients with ulcerative colitis. The excretion of lysine on the evaporated milk diets increased also in the gastric ulcer patients. The excretion of histidine did not vary appreciably during the four regimens.

The fecal excretion of amino acids varied in the three groups (Table 6). For the normal subject, the output was least on the meat and egg regimen and highest during the protein hydrolysate and evaporated milk regimens. For the patients with gastric ulcer, the excretion was slightly higher on the skim milk powder and evaporated milk programs than on the meat and egg regimen, and considerably higher on the protein hydrolysate treatment. For the patients with ulcerative colitis, the excretion varied only slightly on the meat and egg, skim milk powder, and evaporated milk regimens, but it rose appreciably during the protein hydrolysate regimen.

COMMENT

Peptic Ulcer. The present data indicate no gross abnormality in protein metabolism in patients with uncomplicated peptic ulcer (1). The minor variations in the free amino acids of the plasma were not considered significant. The patterns of amino acid excretion in urine and feces were similar to those in the normal subjects.

Comparative analysis of the utilization of protein from meat and egg, skim milk powder, evaporated milk, and protein hydrolysate indicated that the whole protein of meat, eggs, and milk was well utilized by these patients (4). In this study with supplemental proteins, the between-meal and bedtime feedings were made with: (a) evaporated milk plus water; (b) skim milk powder plus water and vanilla ice cream; and (c) protein hydrolysate plus water,

TABLE 5*

Excretion of amino acids in urine of a normal person and of patients with gastric ulcer and ulcerative colitis during ingestion of various protein foods

SUBJECT	LEUCINE	ISOLEUCINE	VALINE	THREONINE	ARGININE	HISTIDINE	LYSINE	METHIONINE
	Meat and Eggs Regimen							
	mg./sq. m./day	*mg./sq. m./day*	*mg./sq. m./day*	*mg./sq. m./day*	*mg./sq. m./day*	*mg./sq. m./day*	*mg./sq. m./day*	*mg./sq. m./day*
Normal subject	7	4	9	29	7	91	42	1
Gastric ulcer patients†	14	11	16	22	17	45	34	5
Ulcerative colitis patients†	15	7	14	25	15	82	57	6
	Skim Milk Regimen							
Normal subject	11	7	14	27	10	76	47	4
Gastric ulcer patients†	7	7	9	17	18	32	37	6
Ulcerative colitis patients†	11	5	11	19	13	72	51	4
	Protein Hydrolysate Regimen							
Normal subject	30	12	20	42	26	106	86	14
Gastric ulcer patients†	30	15	21	27	16	36	63	9
Ulcerative colitis patients†	40	16	27	40	24	84	89	15
	Evaporated Milk Regimen							
Normal subject	14	3	12	35	18	101	71	3
Gastric ulcer patients†	11	9	14	17	16	36	89	7
Ulcerative colitis patients†	12	6	12	23	22	65	119	2

* Reprinted with permission from *Gastroenterology* (4). Daily values derived from measurement of six-day collections.
† Average for two patients.

vanilla ice cream, and sugar. The slightly better utilization of amino acids on the skim milk powder regimen probably would not offset the advantage of the convenience of evaporated milk as compared with mixing skim milk powder.

Ulcerative Colitis and Regional Enteritis. Excessive excretion of protein in the feces contributes significantly to the nitrogen deficit in patients with ulcerative colitis and regional enteritis (2); the loss of nitrogen in the feces increases with the severity of the disease. Diminished excretion of total and urea nitrogen in the urine indicates that the catabolism of body protein was not accelerated. The data suggest that the increased outputs of nitrogen and amino acids in the feces can be attributed to loss of intestinal secretions, inflammatory exudate, and blood. The protein metabolism did not appear to be grossly abnormal. For these patients with ulcerative colitis and regional enteritis, 1 gm. protein per kilogram body weight was suboptimal. Positive nitrogen balance would probably have been achieved with higher intake of protein. When two of the patients with ulcerative colitis were given additional high quality protein, 73 per cent of the supplemental nitrogen was converted to urea and ammonia, 24 per cent retained, and only 3 per cent excreted in the feces.

In the study of the comparative utilization of protein from meat and eggs, skim milk powder, evaporated milk, and protein hydrolysate, the utilization of protein appeared to be essentially normal. The nitrogen balance was definitely negative in the patients with ulcerative colitis only during the protein hydrolysate regimen (4). The excretion of nitrogen and amino acids in feces increased markedly during the ingestion of protein hydrolysate; in each case, the number of bowel movements increased and the feces were softer in consistency. In one patient with ulcerative colitis, gross blood appeared in the stools during this period only. The increased loss of nitrogen and amino acids under these conditions may be attributed to a stimulating action on the bowel with increased output of intestinal secretions.

The importance of restoring nutrition and adequate intakes of protein in patients with chronic ulcerative colitis has been emphasized repeatedly (7–9). The present data indicate that feedings of high protein content from milk and eggs are preferable to the use of protein hydrolysates.

SUMMARY AND CONCLUSIONS

Adequate dietary protein is essential in gastrointestinal disorders to compensate for previous depletion and to maintain good nutrition. An adequate intake of protein is especially important for the patient with ulcerative colitis, because of the excess loss of nitrogen and amino acids in the feces.

Protein metabolism is essentially normal in

TABLE 6*

Excretion of amino acids in feces of a normal person and of patients with gastric ulcer and ulcerative colitis during ingestion of various protein foods

SUBJECT	LEUCINE	ISOLEUCINE	VALINE	THREONINE	ARGININE	HISTIDINE	LYSINE	METHIONINE
Meat and Eggs Regimen								
	mg./sq. m./day	*mg./sq. m./day*	*mg./sq. m./day*	*mg./sq. m./day*	*mg./sq. m./day*	*mg./sq. m./day*	*mg./sq. m./day*	*mg./sq. m./day*
Normal subject	161	105	170	150	58	70	150	20
Gastric ulcer patients†	178	146	168	124	113	51	189	58
Ulcerative colitis patients†	464	300	402	297	328	175	471	116
Skim Milk Regimen								
Normal subject	235	226	316	231	160	84	363	56
Gastric ulcer patients†	218	226	203	169	135	72	358	55
Ulcerative colitis patients†	511	363	469	308	356	172	429	84
Protein Hydrolysate Regimen								
Normal subject	337	258	290	292	314	130	484	203
Gastric ulcer patients†	584	328	428	270	234	124	538	134
Ulcerative colitis patients†	835	518	724	577	513	275	857	246
Evaporated Milk Regimen								
Normal subject	349	196	336	257	326	129	379	103
Gastric ulcer patients†	229	210	219	147	153	67	344	75
Ulcerative colitis patients†	519	350	493	337	323	213	500	140

* Reprinted with permission from *Gastroenterology* (4). Daily values derived from measurement of six-day collections.
† Average for two patients.

patients with peptic ulcer, ulcerative colitis, and regional enteritis; and good quality protein provided by meat, eggs, skim milk powder, and evaporated milk was utilized efficiently. Hydrolyzed protein appeared to be less effectively utilized in this study.

In developing a philosophy of continuous treatment in the medical care of patients with certain gastrointestinal diseases, the provision of adequate dietary protein is essential. For the patient with peptic ulcer, one might suggest the continued use of milk feedings, particularly the concentrated milks, such as dried milk and evaporated milk. Nutritional support for the patient with ulcerative colitis or with regional enteritis should include an adequate intake of protein, preferably more than 1 gm. per kilogram body weight; for this purpose, the diet may be supplemented with extra feedings of whole protein. Good dietary instruction—in part by example during hospitalization—is also important.

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The Modified vs. the "Special" Diet

How do we, or how should we interpret the term "modified diet"? Without question, we all wish to remove its meaning far from that of several years ago, when every deviation from the normal was a "special diet." In many instances they were so special that many unnecessary sacrifices were inflicted on the patient and the reputation of the dietitian. Today, the concept that "modified diet" is synonymous with "therapeutic diet" is nationally accepted. In the *Glossary of Dietetic Terms* (1) we note the definition of "therapeutic diet" as "a diet based on the normal diet and designed to meet the requirements of a given situation. It may be modified in individual nutritive constituents, caloric value, consistency, flavor, technics of service and preparation, content of specific foods, or a combination of these factors."

We cannot emphasize too much to ourselves and in our teaching that therapeutic diets *are* modifications of the normal diet. We have turned to the present, most logical yardstick as the foundation for planning the various diets for use in the treatment of particular disease conditions: namely, the Recommended Dietary Allowances of the National Research Council's Food and Nutrition Board (2). A desirable habit to be cultivated always is to speak, write, and think of these accepted standards as recommended dietary allowances for the normal, healthy individual. We use the normal adequate diet as the basic plan for daily food intake, deviating from it only enough to fill the prescription for the disease condition. At the same time we give attention to meeting the requirement of the patient for specific nutrients. For those patients with increased nutritional needs, we may wish to use the guides suggested in the new publication, *Therapeutic Nutrition* (3).

Periodic evaluation of therapeutic diets through use of the short method of dietary analysis (4) will more nearly assure safe and sound dietary care. If inadequacies in the daily diet are unavoidable, they should be called to the attention of the doctor in charge so that supplementary treatment can be provided.

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—Excerpted from: The Modified Diet in Medical Treatment, presented by Grace Bulman, President, A.D.A., before the Kentucky Dietetic Association in Lexington on March 27, 1953.

Growth Trends of Children in Southwest Virginia[1]

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IN 1947 the Virginia Agricultural Experiment Station in cooperation with other agencies completed a four-year study of, among other things, the nutritional status of a segment of the population living in the mountains of Southwest Virginia. Among the groups studied were fifty-four children. The height and weight of these children had been recorded each year the study was in progress (1944–1947).

The investigators in this study used, in addition to the findings of the doctor's examinations, the height/weight technique to evaluate the physical development of these children. They recognized that when the many physique types of children in any one age group are observed, averages, as usually computed, are an inadequate and unsuccessful method for determining physical fitness. In fact, one of the major purposes of the present study has been to illustrate how growth records of individual children may be properly combined into estimates for various groups, e.g., age, sex, developmental level, and physique. Even more significantly here, estimates can be made from these records which represent the distinctly different growth trends of groups that are made up of children who are growing satisfactorily (●) and of those who are in growth failure (⊙) as illustrated in Figure 1.

PROCEDURE

Some time after the conclusion of the study, at the suggestion of the medical personnel,[3] the data on the height, weight, and age obtained from each child's four-year medical record were plotted on a Wetzel Grid (1–4). Where possible, similar information for years previous and subsequent to the conduct of the study was also collected and used. The Grid for evaluating physical fitness and growth of children as developed by Wetzel is based on observations published during the past century of children living in many parts of the world.[4]

In addition to the individual Grids, the developmental levels for the group as a whole were determined from the mean height and weight of all children of the same age, the ages ranging from two to eighteen. These are represented in Figure 1 by the dotted curve *G*. Before grouping the children from different areas, a Grid was plotted to determine the effect of different soil treatments on their development. No marked difference was found. In Figure 2 is illustrated one example of "normal-satisfactory" growth (J. H.—●) and one of a child in quite a severe growth failure (G. H.—⊙).

DISCUSSION OF RESULTS

Figure 1 shows that when the data for the children ages two to three were averaged, these results fell in the A_3 physique channel. Between the ages of three to four and until about six years of age, the average placed the children in the A_1 channel. Averaging the data of the children ages six to eight years showed them to be of medium physique. From eight to sixteen years, their averages placed them in the B_1 or B_2 channels.

[1] Data obtained from the study, "An Effort to Appraise the Effect of Fertilization of the Land on the Growth and Physical Condition of Farm People," conducted cooperatively by the Virginia Agricultural Experiment Station, Tennessee Valley Authority, Virginia Department of Health, Medical College of Virginia, Virginia Agricultural Extension Service, and the Departments of Home Economics and Statistics of the Virginia Polytechnic Institute are used in this article. Received for publication July 14, 1952.

[2] The authors wish to express their gratitude to Dr. Norman Wetzel and his staff for advice, counsel, and assistance with the statistical analyses.

[3] Dr. William J. Darby, Department of Medicine, Vanderbilt University, Nashville, Tennessee, who was the medical advisor for the Tennessee Valley Authority for this study; and Dr. Heinz Meyer, Head, Konnarock Medical Center, Konnarock, Virginia, who served as examining physician during the four years of the study.

[4] Further information concerning the Grid technique may be obtained from the NEA Service, Inc., 1200 West Third Street, Cleveland 13, Ohio.

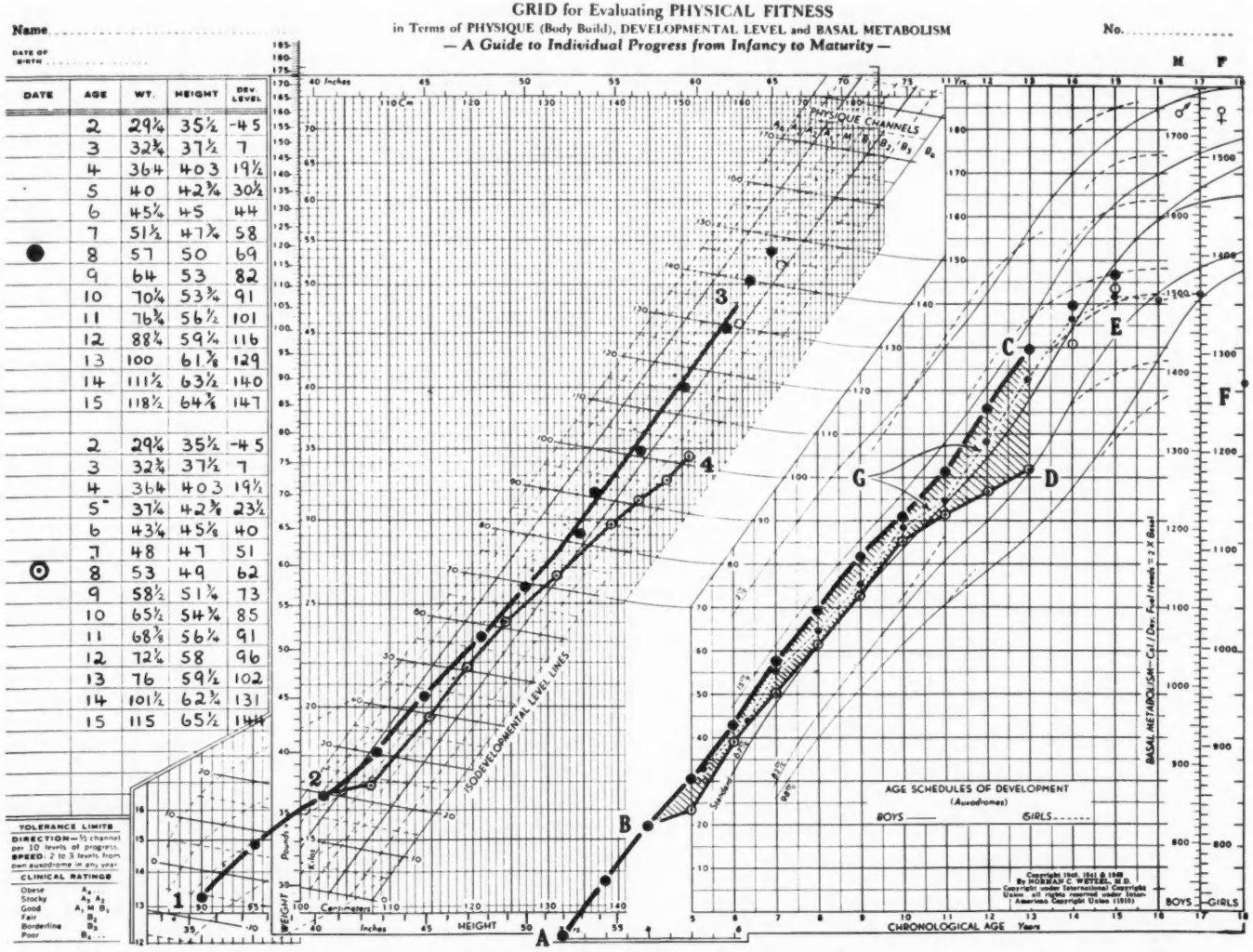

FIG. 1. *Solid, heavy curves show channel (1, 2, and 3) and auxodrome* (A, B, and C) *trends for children (boys and girls) progressing satisfactorily from year to year, whereas the dotted and lighter curves (2 and 4 and* B *and* D) *represent the corresponding trends for those in growth failure at successive years. These, accordingly, are the "normal"* (●) *and "growth-failure"* (⊙) *components of the over-all average trend* G. *The older subpopulation values* (E) *are approximations only, in view of small numbers of measurements available. Nonetheless, the results for the two- to thirteen-year interval clearly distinguish the two types of growth which the children in the study group manifested.*

From the standpoint of relative age-advancement and retardation, the group as a whole developed on auxodromes in the central 15 to 67 per cent zone. However, the children with comparatively satisfactory growth (*ABC*—●—*Fig. 1*) maintained, as would be expected, a higher rate of yearly progress than those in growth failure (*BD*—⊙), the average for the former being 12.2 levels per year and for the latter, 9.7 levels per year. This, in turn, dropped off still further to 5.6 levels per year for the period between ten and thirteen years.

Results are in accord with the findings of the study on food intake of the same children, records of which had been collected for a week in the spring and another in the fall of each year of the study. These data show that the adolescents, ages twelve to eighteen, had a lower intake of the nutrients for which the dietary records were calculated than did the children between two and ten. There were, however, only a few children in this group.

The analysis of variance (Table 1) shows that, on the whole, normal girls and boys gained alike. There was no highly significant statistical difference between the normal boys and girls, but the growth-failure boys differed significantly from the growth-failure girls, especially after ten years of age.

After the children reached ten years of age, their numbers decreased. However, in an effort to see what the trend might be, the data for each sex were plotted on a Grid. It showed that the girls' physique and development improved, whereas the boys' declined and were finally below Grid standards. The investigation of the mean food intake of these groups explains neither this difference in development of the two sexes nor the satisfactory developmental levels of the girls whose mean food intake each year and season was less adequate than that of the boys (5).

There was a wide range of differences in rate of growth between individual children and also for each individual child. Figure 1 shows that the children *without growth failure* kept to channel direction

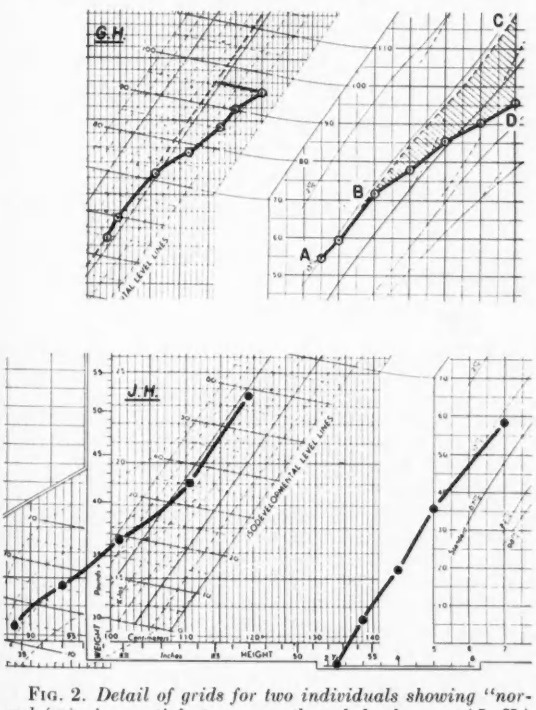

FIG. 2. *Detail of grids for two individuals showing "normal" (●), i.e., satisfactory, growth and development (J. H.) and "growth failure" (⊙) (G. H.), the latter showing conspicuous departures from expected channel and auxodrome.*

TABLE 1

Four-factor analysis of variance

SOURCE	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE
Main Effects			
Sex	1	78.72	78.72*
Years	13	405,785.43	13,214.26**
Type of growth (normal/growth-failure)	1	1,126.34	1,126.34**
Auxodrome (A-N-R)	2	17,983.00	8,991.50**
Total	17		
First Order Interactions			
Sex × years	13	521.20	40.09*
Sex × N/GF	1	255.05	255.05**
Sex × auxodrome	2	41.76	20.88
Years × N/GF	13	456.58	35.12
Years × auxodrome	26	365.34	14.05
N/GF × auxodrome	2	97.00	48.50
Total	57		
Second Order Interactions			
Sex × years × N/GF	13	368.87	28.37
Sex × N/GF × auxodrome	2	5.15	2.58
Sex × years × auxodrome	26	1,087.57	41.83*
Years × N/GF × auxodrome	26	371.33	14.28
Total	67		
Third Order Interactions			
Residual	26	450.18	17.32†
Grand total	167	428,993.52	

* Significant at 5 per cent level.

** Significant at 1 per cent level.

† Perhaps an even more appropriate estimate of error can be obtained in this set by pooling all interactions except Sex × N/GF, viz., 3,764.98/149 = 25.3, so that s (of a single observation) is approximately 5 levels, with 149 degrees of freedom as compared with the 26 above for error.

distinguish the two types of growth which the children in the study group manifested.

very well and to a 12-level-per-year rate of advance along an average auxodrome just slightly ahead of the 67 per cent standard. In comparison, those in growth failure lost physique, drifted from channel M to B_3 and fell behind in the rate of growth. Owing to this typical slowdown, with greater lag each year, growth failure amounted to 27 levels at thirteen.

Figure 2 shows a child (J. H.) who was developing well from the ages of two to seven years. Throughout this period, she advanced 12 levels or more per year. Her physique type changed from a chubby infant build to the A_1 type, and only about 15 per cent of the children in the United States exceeded her in physical advancement. At the age of four, she was reported to have had a tonsillectomy and rheumatic fever, yet this did not affect her growth as judged by annual measurements. Her diet, when compared to the standards of the National Research Council, indicated that her intake of all nutrients was adequate except for ascorbic acid. This inadequacy might have accounted for the reported red, swollen tongue and gums, dry skin, irritability, nervousness, fatigability, and muscular tenderness.

Another child (G. H.) was studied in like manner. He gradually regressed to a poorer physique type and at the same time slowed down to considerably less than the normal rate of 12 levels per year. No particular chronic disease was reported during this period. This condition may have been due to the fact that his diet, when compared to the recommendations of the National Research Council, was inadequate in all nutrients except vitamin A and riboflavin. Physical examinations reported some pathologic conditions which might be attributed to nutritional deficiencies.

The Grid (not shown) of another child indicated the effect that disease and its subsequent treatment may have on growth. Between fourteen and fifteen years of age, this adolescent's development dropped 2 levels. At sixteen she had an appendectomy, and she dropped 9 levels. She regressed from A_3 physique type to A_1 type. She did, however, show rapid improvement following the operation, returning to the original A_3 physique channel.

It is probable that where abnormal conditions were reported among these children, they might have been alleviated, in part at least, by better nutrition.

SUMMARY AND CONCLUSIONS

The growth and nutritional status of fifty-four children living in a mountainous region of Southwest Virginia were studied. The average child in the group was of good or fair physique type. This was in line with mean food intake which approximated the recommended allowances of the National Research Council. Until about fifteen years of age, the children in this study developed according to schedules somewhat ahead of Wetzel's 67 per cent Grid standard. The girls showed better growth than the boys. Using the recommendations of the National Research Council as a standard, the mean food intake of the girls was less satisfactory than was that of the boys.

As in any group, there was considerable variation in physique types and in developmental levels. Characteristically, however, physique as well as rate of progress was adversely altered in the growth-failure group, and age tended to augment both effects.

The possible effect of poor nutrition and disease on growth is demonstrated in individual cases.

The occurrence of abnormal signs and symptoms might indicate nutritional inadequacy.

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Sources of Homemaker's Recipes

"Would taste good" is the most important selling point of a recipe for homemakers, it was discovered in a survey of 3500 women made last year for the United Fruit Company. "Easy to follow" and "easy to use" were other important features. "Just like it best" was the reason 42 per cent of cook book users gave for liking their favorite cook book; "has favorite recipes" and "easy to use" ran a poor second and third.

These and other findings have been reported in a colorful, fifty-nine-page looseleaf booklet titled *Findings from a National Study on the Use of Recipes and Cookbooks*. Seventy-four per cent of the homemakers interviewed, it was found, had recipes in their homes. Among those who did not, or who had recipes but did not use them, were a larger percentage of older women, those with less education, and those in the lower economic brackets.

Among all homemakers, 61 per cent had single recipes, 50 per cent had leaflets or booklets, and 67 per cent had cook books. Seventy per cent of those having recipes had used one or more during the previous six months. Printed recipes comprised 64 per cent of those reported; 26 per cent were recipes obtained from friends or relatives. Cooking classes, radio, and TV supplied exceedingly few. More newspaper and magazine recipes had been obtained from articles than from advertisements, but one-fourth of all were classified as "don't remember."

More desserts, especially cakes and pies, were prepared from recipes than any other foods.

Appraisal of School Lunch Programs

II. Changes in Management Practices after In-Service Training[1]

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THIS research project was conducted to study the relation of certain management factors in the school lunch to nutritive value and pupil participation. Numerical measurement of these management factors was used as a means of determining whether increases in nutritive value and pupil participation would accompany improvements in practices and policies of school lunchroom operation. Development of the score card by which this numerical measurement was accomplished was described in the first paper of the series (1).

The present paper reports the study of management factors and the changes effected by in-service training. A third paper will report the effects of the changes in management factors on nutritive value and pupil participation.

The data for this project were collected by a procedure similar to that described by Dreisbach and Handy (2) in a report of studies of management in thirty-nine school lunch programs. Their studies were conducted by making detailed observations of one day's operation of each program. Data were collected on the food served, labor used, preparation and service of the food, use of time, cleaning processes, space and equipment, and receipts and costs. The authors suggested that comparison of the findings from repeated studies in other years could provide information on improvement in certain aspects of management.

DESCRIPTION OF SCHOOLS

This study was conducted during the 1950–51 school year in thirteen schools in one Ohio county. This county was selected because the lunchrooms in all of these schools were participating in the federal school lunch program, because they served only the Type A lunch, and because they varied in location, size of enrollment, and arrangements for lunchroom management.

Enrollment in the thirteen schools at the time of the initial survey varied from 35 to 475, while the number served in the lunchrooms ranged from 25 to 250. This county is primarily agricultural, with ten of the schools in small rural communities or distinctly rural areas; three are located in villages. Most of the children are transported to school by bus.

Four of the lunchrooms were supervised and operated by untrained cook-managers, while four others were supervised by the principals with one or more cooks who prepared and served the food. The home economics teachers in two schools acted as managers, each having two cooks who prepared and served the food. The other three schools, which were in the same township, were under the supervision of one manager, who planned the menus and purchased the food; one cook in each school was then responsible for the actual food preparation and service.

METHOD

The general plan included three phases: (a) an initial survey in which each school was rated by means of the score card already described (1) and data were collected for calculation of nutritive value and pupil participation; (b) in-service training of lunchroom personnel planned to improve the practices responsible for low scores and to raise the nutritive value of the lunches served; and (c) a final survey to determine differences which might be attributed to the training program.

The entire project was conducted by one home economist with training and experience in nutrition and food service. She made the observations for the initial survey during a six-week period in the autumn, conducted the training programs for the lunchroom

[1] The data reported are taken from the dissertation submitted by Jessie Craig Obert to the Graduate School, The Ohio State University, Columbus, in partial fulfillment of the requirements for the degree of Doctor of Philosophy in home economics. The entire project was financed by a grant from The Ohio State University Development Fund. Received for publication March 2, 1953.

[2] Present address: Los Angeles County Health Department.

personnel during a ten-week period in the winter and early spring, and collected the data for the final survey during a thirteen-day period in the late spring.

During the initial survey, the home economist spent a two-day period in each school. She interviewed the principal and lunchroom manager one afternoon, spent the next day observing the preparation and service of the lunch and obtaining the amounts of all foods used for that lunch, and marked the score card according to her observations. She returned to the school the following day and again observed the preparation and service of the lunch, but the latter observations were used mainly to obtain information that would be helpful in planning the educational programs. On the basis of the second day's observations and those on subsequent visits, it is believed that practices on the days the schools were scored were representative of those practices on other days.

Since the home economist was responsible for scoring the schools during both surveys, it was considered desirable to have a check on the reliability of the scoring. This was provided by having another observer join in scoring Schools 1, 7, and 13 during both surveys. In all cases, variation of the scores of two observers was within the limits set during the development of the score card. This was described in detail in an earlier paper (1).

RESULTS OF INITIAL SURVEY

Examination of the score card data[3] showed that the total scores (hereafter called "scores for All Items") varied from 97 to 149, with equal numbers of schools scoring above and below the median of 128. Scores for Part I, Management and Facilities, varied from 25 to 47; for Part II, Food and Service, from 54 to 87; and for Part III, School and Community Participation, from 9 to 24. The statistical method of analysis of variance (3) was used to test the significance of these differences.[4] Results showed that real differences, i.e., differences which were too great to be due to chance, existed between the schools for each of the three parts as well as for All Items. This analysis also indicated that no definite relationships existed among the items in any of the three parts or in the entire score card.

[3] Development of the score card was described in a previous paper (1). It included forty items, each of which was scored on a scale from 1 to 5. Thus the maximum possible score for all items was 200. The forty items were divided into three sections for purposes of examination and analysis: Part I, Management and Facilities—thirteen items, maximum score, 65; Part II, Food and Service—nineteen items, possible score, 95; Part III, School and Community Participation—eight items, maximum score, 40.

[4] The methods used in statistical analysis of the data were suggested by D. R. Whitney, Director, Statistical Laboratory, The Ohio State University, and calculations were checked in that Laboratory.

IN-SERVICE TRAINING

The original idea for the in-service training was to group the schools according to their needs for help as shown by the scores. However, no definite patterns were found in the relationships between scores of other items and quality of the food, nutritive value, or pupil participation. Thus, the idea of grouping according to need was abandoned, and an individual plan was developed for each school. Help was then given during visits to each school and through meetings of the entire group.

A summary was first made for each school showing the items on which scores of 1 or 2 (the two lowest scores possible) had been assigned. The objectives for the educational work with each school were stated in terms of improving the practices responsible for the low scores. A plan was then developed by which these objectives might be accomplished. The objectives and plan for improving the practices in one school will be discussed briefly as an example of this procedure.

Objectives and Plans for School 1

The items in Part I, Management and Facilities, on which a score of 1 or 2 was marked, included: method of menu planning (no definite plan was used); method of purchasing (all food was purchased at retail at the local store); use of recipes (tested recipes were not used); and time management (lunch preparation was finished by 9:30 A.M.). The items in Part II, Food and Service, receiving scores of 1 or 2, included: arrangement of serving table (plates were passed in opposite direction to movement of the line of children); line to serving counter (congestion and much crossing of the line); quantity of food (servings for lower grade children were too large, for upper grade children, too small); appearance of plate (food carelessly served, side dishes not used when needed); and quality of food, including flavor, seasonings, color, texture, consistency, shape and form, and temperature (generally poor).

The review of the score card resulted in the statement of four objectives, which are listed below together with the ways in which it was planned to achieve them. There was, of course, some overlapping, because the same method could be used to assist in meeting more than one objective.

I. Improve quality of meals served
   a. Check menus; assist cooks in planning menus; encourage use of a menu-planning guide
   b. Assist cooks in calculating amounts of food required for Type A lunch
   c. Participate in preparing a lunch; instruct cooks in correct preparation and cooking methods; encourage use of tested recipes
   d. Assist cooks in making work plans to improve time management

II. Purchase more foods from wholesale sources
   a. Discuss purchasing practices with superintendent and cooks
III. Reduce time required for service of food and reduce confusion of pupils in waiting line
   a. Rearrange serving counter for more efficient service
IV. Serve lunches of high nutritive value
   a. Assist in menu planning
   b. Assist in planning amounts of foods needed
   c. Serve complete lunch to all pupils

A similar plan was made for each of the other twelve schools. These plans were used as the basis for the entire educational program which included group meetings and individual conferences.

General Plans for All Schools

The educational programs, which covered a period of ten weeks, consisted of: (a) a series of five workshops to which lunchroom personnel from all schools were invited and (b) visits to the lunchrooms to help with individual problems. One meeting was held with the teachers of each school, and a number of talks were made to community groups. This paper will cover only the work with lunchroom personnel. It should be mentioned that the home economist in this project was acting in an unofficial basis and that she had no authority in the schools. Her methods were of necessity somewhat different from those that would be used by a supervisor who is a regular member of the staff with corresponding authority.

The immediate objectives of the training of school lunch personnel were: (a) to raise low scores on individual items and thus, raise the scores for All Items; (b) to improve the nutritive value of the lunches; (c) to increase the number of lunches meeting the food requirements for the Type A lunch. Plans were made to study the effect of these changes on participation, although no specific efforts were made to increase participation.

The observations of the initial survey indicated the need in many or all schools for help with practices in relation to three procedures in menu planning, namely: the method of calculating the amounts of protein-rich foods, vegetables and/or fruits, and butter or fortified margarine required for serving a given number of lunches; ways to achieve variety within the limits of the Type A pattern, especially in main dishes and vegetables; and ways to make the lunches palatable and attractive.

The need for help with the following procedures in food preparation was also seen: methods of cooking protein foods; cooking paste products, especially macaroni and spaghetti; preparation of white sauce as a basis for macaroni and cheese and other dishes; methods of heating canned vegetables; preparation and holding of raw vegetables; preparation of sandwiches; and work-saving methods in food preparation.

Workshops. The workshops were held in different lunchrooms, one each week for five weeks. They included discussion and demonstration of various procedures on which scores were low in many of the schools. The first four workshops were 2-hr. meetings, each featuring the planning and preparation of a meal representative of a Type A lunch. One menu used a paste product (combined with protein) in the main dish, one a soup-sandwich combination, one a main dish of dried beans, and the last a meat-and-vegetable combination main dish. Each menu was planned so that it provided opportunity for demonstration or discussion of the practices and procedures in which a need for improvement had been observed. Donated foods from the Department of Agriculture were used in each menu so that opportunity was provided to suggest ways of using them and to demonstrate various methods of preparation. All recipes used were school lunch recipes published by the Department of Agriculture (4–7).

The fifth workshop was an all-day meeting held during spring vacation. The morning session included a discussion and demonstration of menu planning in which all present participated. The afternoon session consisted of a demonstration by the home economist of simple ways to perform operations frequently used in the lunchrooms, and a period in which each participant received help in planning menus for her own lunchrooms.

Visits to Individual Lunchrooms. Concurrently with the workshops, visits to individual schools were made by the home economist. From one to eight visits were made to each of the lunchrooms to give assistance with problems of an individual nature and to provide a continued supervision. These visits consisted of participation by the home economist in the preparation of the lunch with informal instruction by means of explanation and demonstration of recommended procedures. Additional conferences were held with the administrators and managers at other times to help them with menu planning and other practices which could not conveniently be discussed during the preparation of the lunch.

Final Survey

After the conclusion of the educational activities, each school was again rated by use of the score card, and information was collected for calculation of nutritive value and pupil participation.

RESULTS

The effects of the educational programs were evaluated by comparing the scores of the schools during the initial and final surveys.

Comparison of Scores

Individual Schools. The significance of the differences between scores of individual schools was com-

TABLE 1

Differences between initial and final scores of individual schools

SCHOOL	DIFFERENCES IN SCORES			
	All items	Part I	Part II	Part III
1	35*	17	18	0
2	16	7	4	5*
3	6	−5	9	2
4	5	2	1	2
5	41*	15	19*	7*
6	−4	−13	7	2
7	25	10	15	0
8	7	1	4	2
9	56*	17	36*	3
10	6	−6	11	1
11	18	12	5	1
12	14	6	4	4*
13	19	3	15	1
Two times standard deviation†	33.6	18.6	18.8	4.0

* Statistically significant.

† Standard deviation of the mean derived from the formula $\sqrt{2\frac{E}{(r-1)(c-1)}}$

where E is the error mean square, r is the number of rows (items on score card), and c is the number of columns (schools).

pared with twice the standard deviation of the mean (3) (Table 1). Significant increases in scores for All Items occurred in three schools. There were no significant changes in scores for Part I. Significant improvement in scores for Part II occurred in two schools and for Part III in three schools.

A comparison of the actual numerical differences between the scores of individual schools at the time of the initial and final surveys (Table 1) shows that the score for All Items had increased in twelve schools and had decreased in one school. Scores for Part I increased in ten schools and decreased in three schools. Scores for Part II increased in all schools, while those for Part III increased in eleven schools and remained the same in the other two.

Schools as a Group. The "t" test (3) was used to determine whether the differences in the scores of all schools taken as a group were due to chance or might be attributed to the educational programs. The results are reported in Table 2. They indicate that the mean differences (improvements) between the schools during the initial and final surveys were too great to have occurred by chance.

TABLE 2

Differences between initial and final scores of the group of thirteen schools

PART OF SCORE CARD	MEAN DIFFERENCES BETWEEN SCORES	STANDARD DEVIATION	t VALUE	DEGREES OF FREEDOM
All items	18.8	5.1	4.028*	12
Part I	5.1	2.6	1.965*	12
Part II	11.4	2.6	4.345*	12
Part III	2.3	0.6	4.127*	12

* Statistically significant.

DISCUSSION

Any study conducted in the public schools must operate within the limits of the regular school program. Certain problems encountered in this study arose because of activities and circumstances over which the investigators had no control. These problems had to be met or solved as they occurred. They included school parties and half-holidays, but since these were usually planned in advance, visits to these schools were made on other days. Some observations were necessarily made when the rate of absenteeism was high because of an epidemic. Loss of two weeks' school due to severe weather resulted in some delay in conducting the training activities.

However, a study such as this must operate despite these occurrences which may be considered as normal deviations from school routine. They emphasize the need for keeping plans flexible enough that the fundamental nature of the project is not destroyed.

The reactions of the school personnel varied from active opposition in one or two schools, through passive acceptance, to eager, wholehearted cooperation in all phases of the study. The importance of continued, thorough interpretation of the implications of the school lunch, of the research project, and of the interest and function of the organization conducting the study may be found in the responses of the various individuals involved. In some of the schools, interesting the administrator and lunchroom manager was enough to insure the success of the project. In others, the lack of understanding and support by teachers and board members made it difficult to obtain the cooperation of the lunchroom personnel. In Schools 1, 5, and 9, cooperation of teachers and lunchroom personnel was considered outstanding. In Schools 3, 6, and 10, members of the school board opposed the study, with resulting lack of cooperation by the cooks. Comparison of the data in Table 1 will illustrate the effect of these differences.

The significant increases in scores for All Items and for Parts I and II in Schools 1, 5, and 9 were attributed by the home economist to the improvements in management practices made possible through the excellent cooperation of the administrators and lunchroom personnel in the training programs. The significant change in score for Part III, which occurred in School 2, was due to other circumstances which increased the interest and active assistance of a community organization. In that case, a growing deficit in the school lunch fund

caused the parent-teacher organization to underwrite the deficit for the remainder of the year. The change in score for Part III in School 5 was likewise due to financial help of the parent-teacher organization, but in this case it was due to an expressed intention of supporting the study. In general, it may be said that the significant increases occurred in those schools considered most cooperative.

On the other hand, the decreases occurred in three schools which were under the same management and resulted from changes in practices (principally in those concerned with menu planning) which occurred when there was a change in management. Because of this and the opposition of the school board, cooperation in these schools was obtained only toward the end of the study.

Since the study covered only one school year, no data are available on the extent to which the changes observed at the time of the second survey were carried over into daily usage. (It should be mentioned that when the county superintendent requested cooperation of the schools in the project, he emphasized the point that the schools were free to return to their original practices after the close of the study.) However, the objective was not to produce permanent changes but to see whether the practices could be changed significantly with the help of the home economist. The results indicate that the training programs *were* effective in some of the schools. It seems reasonable, then, to conclude that provision of regular supervision by a home economist might result in permanent improvements. The unofficial capacity of the home economist in the study has already been discussed.

A second objective was to see whether the score card offered: (a) a feasible method of evaluating the total lunch program or certain parts of it; (b) a means of recognizing which practices were in need of improvement; and (c) a method of measuring the improvements which were effected. Results of the study indicate that this score card *was* useful in evaluating the points it covered and that it could be developed to cover all parts of the school lunch program. Certain limitations and precautions in its use were discussed in the first paper of this series (1).

SUMMARY

The effect of an in-service training program on certain management factors in the school lunch was studied in thirteen Ohio schools. During an initial survey, the factors selected for study were rated numerically on a score card. The findings constituted the basis for planning specific training programs to improve practices and so increase the scores. These programs were conducted by a home economist with training in nutrition and food service. They included group meetings and individual contacts with lunch room personnel. After completion of the training, a resurvey was made in which the same factors were again rated. Differences between the scores in initial and final surveys provided a basis for estimating the effect of the training.

Statistical analysis of these data showed that there was a significant increase in total scores for the group of thirteen schools, and that the individual increases in three of the schools were also significant. The relationship of the changes in management practices to nutritive value and participation will be described in a subsequent paper.

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Brain Responses to Odors

Coffee smells stronger than onion or camphor, at least according to brain wave recordings made from the region of the olfactory bulb, where the nerve of smell expands in the brain.

According to a report from Drs. Carl W. Sem-Jacobsen, Reginald G. Bickford, Henry W. Dodge, Jr., and Magnus C. Petersen of Rochester, Minnesota, the largest amplitude responses came from: valerian, coffee, lilac perfume, cloves, benzene, peppermint, lavender, and lemon. A moderate reaction was shown to wintergreen, onion, turpentine, camphor, and cinnamon. Almost without effect were room air, acetone, and alcohol.

Sleep appeared to reduce the response, but did not entirely abolish it. No characteristic frequency of brain waves was found for any of the substances tested.—*New York Times, August 30, 1953.*

A Guide to Statistics

III. Graphing and Correlations

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THIS series of three papers, constituting a "Guide to Statistics," is being presented to help readers who have not had training in statistics understand the concepts of statistical evaluation of research data. Statistics is a tool in research, just as physical laboratory equipment is. The first papers in this series (1, 2) discussed "Concepts and General Considerations" and "Calculation of Statistics" respectively. In this section, methods of graphic presentation of statistical material and the concepts of correlation and causality will be discussed. Examples will be presented to show methods of fitting curves, and the presentation will be concluded with a bibliography of texts on statistical theory and methods.

Fitting of Empirical Curves

The investigator, after graphing his primary data, would frequently like to do the following:

(a) Find a simple formula which expresses directly the dependence of a factor (y) on another factor (x).

(b) Determine the degree and reliability of any correlation between (y) and (x) which is *apparent* in the graph.

These two related objectives will be treated as separate topics in this paper.

If the alignment of points in the graph follows, in general, along a straight line, then one would like to determine the formula of that straight line which best summarizes the general trend apparent in the graph. Often, however, the graph indicates a more complex relationship between (y) and (x) so that one of two approaches is necessary:

(a) One may determine a more complex formula "fitting" the general trend exhibited.

(b) One may first subject the data to a mathematical transformation which "arranges" the points in a more nearly linear fashion and then determine the formula of that straight line.

There are well recognized methods for carrying out Approach (a) which allow one to abstract the character of the curve as a composite of trends—linear, quadratic, cubic, and so on—but these are beyond the scope of this discussion. For reference, however, the reader will find such methods treated most elegantly under the subject of regression analysis. Approach (b), which is quite adequate for many purposes, will be developed here in an elementary fashion.

Some of the simplest and most widely used types of transformation are the following:

Logarithmic transformations
Exponential transformations
Certain algebraic transformations
The "probit" transformation

Logarithmic Transformations

The logarithmic transformation is probably the most commonly used and is easily formulated as follows:

Suppose that the data fall along an "exponential type" of curve, as frequently encountered in biology, e.g., the rate of growth of a population of freely dividing cells or the rate of radioactive decay. Symbolically,

$$y = ke^{ax}$$

where
y = dependent variable
x = independent variable
e = base of natural logarithm
a, k = constants

Transforming logarithmically

$$\log_{10} y = \log_{10}(ke^{ax}) = (a \log_{10} e)x + (\log_{10} k)$$

One then identifies the following

$$Y = Ax + B$$

where

Y = $\log_{10}$ y, plotted on the Y axis against (x)
A = a $\log_{10}$e
B = $\log_{10}$k

This transformation converts an exponential relationship into a linear one. One recognizes the "ex-

[1] Present address: Rome, Italy.

ponential" character of the original data if the resulting graph does, indeed, assume a linear character.

Exponential Transformations

Suppose that the points appear to fall along a logarithmic-type curve. In this case, the logarithmic transformation is merely reversed, since "linearizing" in these cases depends on the use of the *inverse function* of the function "apparent" in the primary graph. Hence, an exponential transformation linearizes a logarithmic trend.

Algebraic Transformations

Here, again, the choice of the proper *inverse function* will "linearize" the graph:

(a) *Parabolic in character.* $y = kx^2$ may be transformed by the inverse operation [taking the square root of (y)]:

$$\sqrt{y} = x\sqrt{k}$$

and plotting $\sqrt{y}$ as Y against (x) in the new graph.

(b) *Cubic in character.* $y = kx^3$ may be transformed by taking the cube root of (y):

$$\sqrt[3]{y} = x\sqrt[3]{k}$$

and plotting $\sqrt{y}$ as Y against (x) in the new graph.

(c) *An odd power of some unknown magnitude.* $y = kx^n$ may be transformed empirically [taking various roots of (y) until linearization takes place as indicated by the graph]:

$$\sqrt[n]{y} = x\sqrt[n]{k}$$

Carry out by graphing various roots $\sqrt[n]{y}$ as Y against (x).

The Probit Transformation

This is such an important transformation and so widely used in modern investigation that a fairly comprehensive basis underlying its use will be detailed. The word *probit* is an abbreviation of the term *probability* and suggests the basis of the method. The effect of this transformation may be readily appreciated through a consideration of Parts A and B of Figure 1, in which the A represents the normal distribution curve and B the Sigmoid curve. B is related to A in the following manner: A given *area, measured from the origin in A*, e.g., area (a), *is represented by a corresponding height in B*, e.g., (h_a). B is commonly called the integral of A. In both A and B, (x) represents the *degree* of some treatment, e.g., dose of a drug or length of exposure to light.

The symbol (d) denotes an alteration, either (+d) or (−d), away from the *mean*, (μ), and this alteration (d) may be interpreted in two different fashions:

(a) As a change in *degree* of treatment above or below the mean effective treatment (μ).

(b) As a *deviate* in the statistical sense $\left(\frac{x-\mu}{\sigma}\right)$,

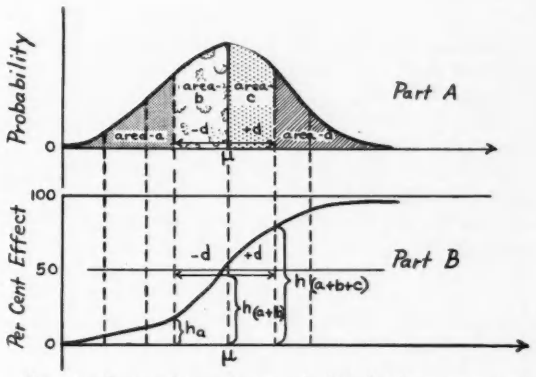


FIG. 1. *Comparison of normal distribution curve and Sigmoid curve.*
A = normal distribution curve
B = Sigmoid curve
d = alteration or change away from mean

that is, as an alteration in effectiveness *relative* to the *standard* variability of the population.

In short, while neither area-change (A) as such or percentage area-change (B) are *linearly* related to treatment, the deviate corresponding to area-change *is* linearly related to treatment. Hence, if *percentage effects* are first transformed into deviates, they should yield a straight line when plotted against treatment.[2]

In practice, one usually adds 5 to the calculated deviate to yield a *probit*. The object of this addition is to convert all deviates to positive values for ease in graphing. That the addition of 5 to the deviate will always suffice is justified by the fact that a deviate less than −5 is highly improbable.

Fitting a Straight Line to Linearized Data

After reduction of the data to a linear trend by an appropriate transformation, one may proceed to determine the straight line of "best fit."

All straight lines in a plane are represented by rectangular coordinates by the formula:

$$1.\ y = mx + b$$

This formula is completely characterized when the constants (m) and (b) have been determined. Two methods commonly used in the determination of the constants (m) and (b) are: (a) the method of *averages* and (b) the method of *least squares*.

Both methods depend on the fact that, in a given group of measurements, the mean is the most probable value. This fact alone suffices as a basis for the method of averages, while an additional fact is needed in the method of least squares. In this method, the *sum of the squares of deviations* of given values from the mean is minimized (made *least*) through the methods of the calculus.

[2] Sometimes two or more transformations are combined in the linearizing process, e.g., probit (effects) against log (dose).

Method of Averages

Assume the following values to represent the linearized values to be fitted.

x factor	$x_1 , x_2 , x_3 , \cdots x_r , x_{r+1} , \cdots x_n$
y factor	$y_1 , y_2 , y_3 , \cdots y_r , y_{r+1} , \cdots y_n$

Divide the data into two parts and build two sets of equations, based on the Formula 1, $y = mx + b$,[3] which are totaled with respect to the given terms of the equation.

Set I

$$\begin{aligned} y_1 &= mx_1 + b \\ y_2 &= mx_2 + b \\ &\cdots\cdots\cdots\cdots \\ y_r &= mx_r + b \\ &\cdot \\ &\cdot \\ &\cdot \end{aligned}$$

$$\text{Total: } (\Sigma y)_I = m(\Sigma x)_I + (rb)_I$$

Set II

$$\begin{aligned} y_{r+1} &= mx_{r+1} + b \\ y_{r+1} &= mx_{r+1} + b \\ &\cdots\cdots\cdots\cdots \\ y_n &= mx_n + b \\ &\cdot \\ &\cdot \\ &\cdot \end{aligned}$$

$$\text{Total: } (\Sigma y)_{II} = m(\Sigma x)_{II} + [(n-r)b]_{II}$$

The subscripts I and II denote the respective sets from which the "totaling equations" were derived. When resulting "totaling equations" are solved simultaneously for (m) and (b), by algebraic methods, one has fully characterized the data trend by the method of averages.

Method of Least Squares

As previously stated, the determination of the constants (m) and (b) requires a special minimization of the sums of the squares of the deviations of the values from the mean. While an exact mathematical statement of "minimization" is beyond the scope of this article, its objective is clear: to yield values for (m) and (b) such that their variability about the mean is *weighed* both with respect to their number and degree of individual variation. The resulting formulas for (m) and (b) are:

$$2. \quad m = \frac{n\Sigma xy - \Sigma x \cdot \Sigma y}{n\Sigma x^2 - (\Sigma x)^2}$$

$$3. \quad b = \frac{\Sigma x^2 \cdot \Sigma y - \Sigma x \cdot \Sigma xy}{n\Sigma x^2 - (\Sigma x)^2}$$

where

n	=	number of paired data values
Σx	=	sum of all (x)
Σy	=	sum of all (y)
Σx^2	=	sum of the squares of all (x) values
$(\Sigma x)^2$	=	square of the sum of all values (x)
Σxy	=	sum of the products of all corresponding pairs of (x) and (y) values

[3] Note that (m) and (b) are the *unknowns* here, while the symbols (x) and (y) are the *known* values.

The utility of both the method of averages and the method of least squares is best appreciated by concrete illustration as developed in the section on Examples (p. 1121).

Correlations

The problem of determining the *degree* and *reliability* of an apparent correlation between two sets of data is approached in essentially the same manner as that of determining *c*, *t*, and χ^2. Thus, some statistic estimating the *degree of correlation* is derived. In the present case, this is the well known (r) or *correlation coefficient*. Next, the statistic, (s_r) which appropriately estimates the *variability* of (r) is developed. Finally, the null hypothesis to be tested is formulated:

> What is the probability (p) that there is no (null) correlation, other than that due to random errors in measurement, between the two sets of data?

Just as for a difference between two means, in which one may observe large differences which are of low significance, or small differences which are highly significant, the degree of correlation between two sets of data, as indicated by the magnitude of the correlation coefficient, may indicate a high degree of correlation which is of low significance or *vice versa*. Similar to the significance ratios, $\left(\frac{d}{s_d}\right)$ or $\Sigma\left(\frac{(f_o - f_t)^2}{f_t}\right)$, the ratio $\left(\frac{r}{s_r}\right)$, depending on its number of degrees of freedom, may or may not be normally distributed. If the ratio $\left(\frac{r}{s_r}\right)$ is normally distributed, it may be evaluated as a probability (p) by means of the normal deviate Table of *c*. If the ratio $\left(\frac{r}{s_r}\right)$ is not normally distributed, then some separate table, taking into account its degrees of freedom, must be used. One may, however, avoid the use of an additional table in this case by mathematically transforming (r) into a new statistic (z) with its associated variability (s_z). These new statistics are then used to form the significance ratio $\left(\frac{z}{s_z}\right)$, which *is* normally distributed and may, therefore, always be evaluated by the common Table of *c*.

The formulas used, together with the mathematical transformations to (z), follow:

$$r_{xy} = \frac{\frac{\Sigma xy}{n} - \bar{x}\,\bar{y}}{s_x \cdot s_y}$$

$$s_r = \frac{1 - r_{xy}^2}{\sqrt{N}}$$

$$z = \tfrac{1}{2} \log_e \left(\frac{1 + r_{xy}}{1 - r_{xy}}\right)$$

$$s_z = \frac{1}{\sqrt{n-3}}$$

$$\frac{z}{s_z} = c$$

where

r_{xy} = correlation coefficient. It has a maximum value of 1 for direct correlation[4] or -1 for inverse correlation.
x = a given value in the x-set associated with
y = a given value of the y-set
Σxy = sum of the products of corresponding (x, y) values
$\bar{x}$ = mean of the x-set
$\bar{y}$ = mean of the y-set
s_x = estimated standard deviation of x-values
s_y = estimated standard deviation of y-values
n = number of values in a set
N = degrees of freedom
r = correlation coefficient
z = the transformed statistic of (r), which is normally distributed, even for small samples
c = normal deviate to be evaluated as a probability (p), from Table of *c*

The significance of (z) is a measure of the significance of the original correlation coefficient, (r). If the number of degrees of freedom, *i.e.*, the total number of values in the (x) and (y) sets less 2, is 60 or greater, then the original ratio, $\left(\frac{r}{s_r}\right)$, may also be evaluated as a probability (p) from the Table of *c* and one need not do the (z)-transformation.

[4] A 100% correlation is represented by r = +1 or r = −1, depending on whether it is direct or inverse in character.

Correlation and Causality

Does the existence of a high degree of correlation, which is also highly significant, mean that a direct "causal" relationship exists between the x-factor and y-factor? The answer to this, even aside from philosophic interpretations of the idea of causality, is *no!* Correlations may exist between jointly observed events, although no direct "causal" relationship makes (y) depend on (x). For example, on certain days there is a correlation between the rate of corn growth in Iowa and the number of Iowans who stay inside their houses. These two events are not, however, directly dependent; rather, the correlation which exists is due to their separate relationships to a third factor, the heat of the Iowa sun.

Cautions in Using Statistics

This is, perhaps, the place to emphasize certain readily understood but frequently forgotten points in regard to statistics.

(a) Statistics, like a spectrophotometer, is a tool and cannot be used in blind faith.

(b) Statistics is a mathematical "machine" which operates on data that *the investigator submits* to it. Hence, any ponderable error or bias in the investigator's data must necessarily be reflected in the final statistical evaluation.

To summarize: "Statistics do not lie but statisticians may." If the investigator always dominates the "machine", then *he* (not the machine) is responsible for any interpretation of the results of the statistical analysis.

EXAMPLES

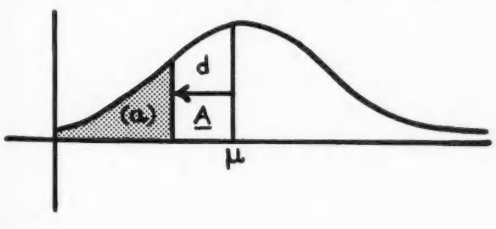
The Probit Transformation

The method of carrying out this transformation is illustrated as follows, using data obtained on rats fed on increasing daily-intake levels of an artificial diet over a 30-day period.

Rats on artificial diet and their growth

INITIAL WEIGHT	INTAKE AT ONE FEEDING	NUMBER OF FEEDINGS DAILY	TOTAL DAILY DIET LEVEL	TOTAL WEIGHT GAINED	GAIN IN WEIGHT	PROBITS
gm.	*gm./kg.*		*gm.*	*gm.*	%	
39	4.0	3	12.0	15	38.5	4.71
29	4.5	3	13.5	12	41.4	4.78
20	5.0	3	15.0	12	60.0	5.25
30	5.5	3	16.5	21	70.0	5.52
30	6.0	3	18.0	26	86.7	6.11

The area (a) in the figure below represents a 38.5% gain in weight.



One must calculate the deviate (d) by first determining the adjacent area (A), *i.e.*, 50* − 38.5 = 11.5%. Now, since this is an area under the *normal* distribution curve, we may determine its deviate by means of the *normal area* table.† Thus, the area 11.5% corresponds to a deviation of approximately −0.29 standard deviation units. The negative sign is prefixed since this is in the negative direction from the 50% level ordinate. To "get rid" of negative signs, one adds 5 to the deviate to obtain the probit, 4.71 (−0.29 + 5 = 4.71) as entered in the above table. One notes that a deviate of (0) will correspond to a probit of (0 + 5), and a probit of 5, therefore, corresponds to the diet level effecting a 50% increase in weight over the thirty-day period.

Calculating, now, the other probits for the successive percentages:

50 − 41.4 = 8.6% giving a deviate of −0.22 (−0.22 + 5 = 4.78 = probit)

60.0 − 50.0 = 10.0 giving a deviate +0.25 (+0.25 + 5 = 5.25 = probit)

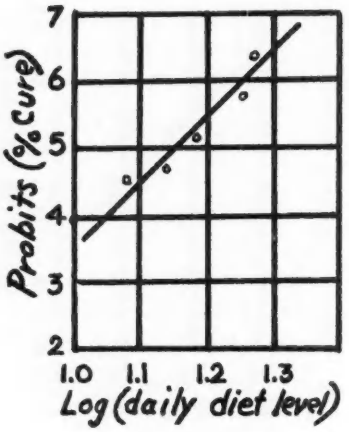
The deviate is (+) in this last case since it corresponds to an area on the (+) side of the 50% level ordinate. In a like manner, the other probits are obtained.

If the probits are plotted against *total* daily diet level, a nearly straight line is obtained, and the daily diet level corresponding to a probit of 5 will be the level corresponding to a 50 per cent increase in weight.

* The area up to μ includes one-half, or 50 per cent, of the total area under the curve.

† A table giving % area under the probability curve may be found in statistical texts, just as Tables of *c*, *t*, and χ^2.

Actually, while the per cent gain in weight data have now been made linear with daily diet level, it is found, in *practice*, that probits plotted against log (daily diet level) give an even better straight-line-fit. The log-transformation, while the most commonly used, is not absolutely mandatory. Any other function of the daily diet level may be plotted against probits that give the best fit in practice. The plot of the log (total daily diet level) against probits is given by the graph:



Method of Averages

x =	10	20	30	40	50	60
y =	21	32	45	57	71	86

Dividing the data into two parts, using Formula 1 for $y = mx + b$:

Set I	*Set II*
$21 = m \cdot 10 + b$	$57 = 40m + b$
$32 = m \cdot 20 + b$	$71 = 50m + b$
$45 = m \cdot 30 + b$	$86 = 60m + b$
I. $98 = 60m + 3b$	II. $214 = 150m + 3b$

Solving algebraically for (m) and (b), from I.

$$b = \frac{98 - 60m}{3}$$

Substituting this value for (b) in II:

$$214 = 150m + 3\left(\frac{98 - 60m}{3}\right)$$

$$214 = 150m + 98 - 60m = 90m + 98$$

$$m = \frac{214 - 98}{90} = \frac{116}{90} = 1.3$$

Substituting m = 1.3 in Equation I:

$$b = \frac{98 - 60m}{3} = \frac{98 - 60 \times 1.3}{3} = 6.6$$

So, $y = 1.3x + 6.6$ = the equation for the line showing the relation between (x) and (y).

Method of Least Squares

Let us use the same figures in the previous example illustrating the method of averages.

x =	10	20	30	40	50	60
y =	21	32	45	57	71	86

To find m and b, calculate as follows:

$\Sigma x = (10 + 20 + 30 + 40 + 50 + 60) = 210$

$\Sigma y = (21 + 32 + 45 + 57 + 71 + 86) = 312$

$\Sigma x^2 = (100 + 400 + 900 + 1{,}600 + 2{,}500 + 3{,}600) = 9{,}100$

$\Sigma xy = (10 \cdot 21 + 20 \cdot 32 + 30 \cdot 45 + 40 \cdot 57 + 50 \cdot 71 + 60 \cdot 86) = 13{,}190$

$(\Sigma x)^2 = (210)^2 = 44{,}100$

$\Sigma x \cdot \Sigma y = 210 \cdot 312 = 65{,}520$

$n(\Sigma x^2) = 6 \cdot 9{,}100 = 54{,}600$

$n(\Sigma xy) = 6 \cdot 13{,}190 = 79{,}140$

$\Sigma x^2 \cdot \Sigma y = 9{,}100 \cdot 312 = 2{,}839{,}200$

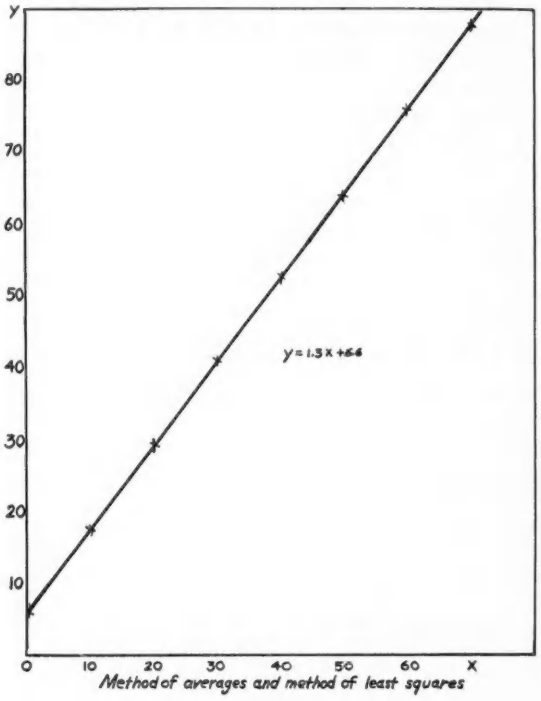
$\Sigma x \cdot \Sigma xy = 210 \cdot 13{,}190 = 2{,}769{,}900$

Substituting in Formulas 2 and 3 for (m) and (b), one gets:

$$= \frac{79{,}140 - 65{,}520}{54{,}600 - 44{,}100}x + \frac{2{,}839{,}200 - 2{,}769{,}900}{54{,}600 - 44{,}100}$$

$$y = 1.3x + 6.6$$

The graph of the final equation and the data are shown in the figure.



Correlation

LACTATE (x-set)	GLUCOSE (y-set)	xy
18.0	81.00	18.0 × 81.0
37.7	57.00	37.7 × 57.0
39.5	32.50	39.5 × 32.5
72.5	20.70	etc.
55.6	21.10	"
68.8	27.70	"
90.0	9.70	"
100.0	18.00	"
103.0	4.36	"
97.1	1.00	"
58.9	2.64	"
129.9	1.86	"
871.0	277.56	$\Sigma xy = 13{,}086.60$

lactate mean = 72.6 = $\bar{x}$ s_x lactate = 31.15

glucose mean = 23.13 = $\bar{y}$ s_y glucose = 23.35

$$r_{xy} = \frac{\frac{\Sigma xy}{n} - \bar{x}\,\bar{y}}{s_x s_y} = \frac{\frac{13{,}086.60}{12} - 1679.238}{727.3525}$$

$r_{xy} = -0.81$ (an inverse correlation)

Having calculated (r_{xy}), one must estimate its variability or, since in this case N < 60, transform to (z) and (s_z). Therefore, using the formulas on pages 1120 and 1121:

$$z = \frac{1}{2}\log_e\left(\frac{1 \times r}{1 - r}\right) = \frac{1}{2}\log_e(0.105) = \frac{1}{2}\frac{\log_{10}(0.105)}{0.4343‡}$$

$$z = \frac{1}{0.8686}\log_{10}(105 \times 10^{-3})$$

$$z = 1.1513\,(\log_{10}105 - 3)$$

$$z = 1.1513\,(2.02119 - 3) = -1.1269$$

$$s_z = \frac{1}{\pm\sqrt{n-3}} = \frac{1}{\pm\sqrt{9}} = \pm\frac{1}{3} = -0.33^{**}$$

$$c = \frac{z}{s_z} = \frac{-1.1269}{-0.33} = 3.4$$

$$p < 0.001$$

‡ Note that in transforming from the base e to logarithms to the base 10, one uses the relationship $\log_e x = \frac{\log_{10}x}{.4343}$

** Note that the sign (±) chosen for (s_z) is to be chosen the same as that of (s), in this case an inverse correlation and, therefore, negative.

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Herbs and Medicines in Ancient China

The original herbal of China, prepared by Shen Nung, bears a legendary date of 2952 B.C., and lists 250 plants with their uses. By the sixteenth century A.D., an herbal dealing with 816 plants was published, and this book was regarded as important enough to make it a suitable offering to one of the emperors of the late Ming dynasty. This expansion of knowledge was brought about by observation of local flora and fauna; study of their uses in the service of man; and description which travelers and writers made of wild and uncultivated things. Yet the understanding of Chinese flora is still incomplete; one foundation recently made a grant to the Arnold Arboretum at Harvard to provide for a fresh and extensive study of the subject.

Alfalfa's introduction to China was described by Berthold Laufer in his *Sino-Iranica*. A military mission in 138 B.C. brought to China two of its great vegetable treasures, alfalfa and the grape. General Chang Ch'ien, the leader of the expedition, had obtained possession of many Iranian thoroughbred horses for his master. Noticing that they had thrived on alfalfa, he took enough alfalfa seed to plant in the palace grounds. The general also recognized the value of the grape, which was introduced into the province of Shansi where wine-making remains an essential part of the local industry. Laufer continues to describe other plants which are not of west Asian origin: the walnut, coriander, pepper, cucumber, chive, carrot, and many others.

Many flora were introduced into China from Arabia, and because of their Moslem origin, bear the prefix *hui*. These include both fennel and anise, as well as chive. The history of these plants brings not only medical history but that of culture.

Although recent years have brought numerous discoveries for the healing of the sick, medical science still owes much to the past for accumulated knowledge of remedies. Primitive medicine, nearly always empirical, was sometimes superstitious but often based on keen observation. Such observations, confirmed and thoroughly tested, have now become sound modern medical principles. Many centuries before Jenner introduced vaccination (1796), inoculation with smallpox pus had been known in India, China, Arabia, and Africa. Digitalis leaves were known by the Chinese to diminish body fluids in dropsy, long before their introduction into western medicine in 1775.

One of the striking facts in Chinese medicine is the emphasis on diet. Beriberi was known in China as early as 2600 B.C., although its dietary treatment was not known conclusively for the first time until 1880. During the Mongol dynasty in China a scholar, Hu Ssu-Hui, wrote in detail about dietotherapy for "wet" and "dry" beriberi. In his book, *Principles of Correct Diet*, each page has an inscription in one corner, "food cures various diseases." The Chinese have been noteworthy among the nations in their descriptions of dietary treatment for many conditions, i.e., pregnancy, lactation, children at different seasons of the year, and various mental states.—*Excerpted from: Hume, E. H.: Medicine in Asia and the Western World. Bull. New York Acad. Med. 29: 625 (August), 1953; contributed by Mary P. Huddleson.*

Editorial

MARY SWARTZ ROSE FELLOWSHIP

In 1948, The Nutrition Foundation, Inc., made a grant to The American Dietetic Association, establishing the Mary Swartz Rose Fellowship which annually provides $1000 for graduate study and research in nutrition or allied fields. The Fellowship honors an acknowledged pioneer in the field whose accomplishments personalize the spirit of the award.

Provisions of qualification for the Mary Swartz Rose Fellowship are:

Applicants must (a) be members of The American Dietetic Association; (b) have ranked in the upper quartile of their respective graduating classes, and have majored as undergraduates in a field closely related to that in which the Fellowship is sought or have gained equivalent training later; and (c) show promise of making a valuable contribution to the profession.

The recipient of the Fellowship is selected by the Awards, Scholarship and Loan Fund Board of The American Dietetic Association, a six-member board appointed by the Association's President, subject to the approval of the Executive Board. The President and President-Elect of the Association are ex-officio members of this Board.

Nominations of candidates shall be accompanied by adequate evidence of their training and ability to pursue their plans in a satisfactory manner. It is expected that applicants interested in newer aspects of nutrition or allied fields shall receive consideration.

Nominations for the Fellowship and all supporting recommendations shall be in the hands of the Executive Secretary of the Association not later than February 15, 1954. Selection of the recipient and notification of the candidate chosen shall be made not later than April 1. Unsuccessful candidates shall be notified at the same time.

LYDIA J. ROBERTS ESSAY AWARD

In 1951, the Gerber Products Company made a grant to The American Dietetic Association offering a $500 annual prize for five years for the best essay on a subject in the field of the history of nutrition. This award was named for Lydia J. Roberts in honor of her outstanding contributions to nutrition of children. Topics for the next three years' contests are to be as follows:

1954—*The History of Artificial Feeding of Infants*

1955—*Nineteenth Century Leaders in Infant Feeding*

1956—*The History of Nutrition Education Programs for Children in the United States*

RULES GOVERNING THE AWARD

The rules governing the Award are as follows:

1. The Award shall be open to: any graduate student of nutrition in an accredited university; any dietetic intern in an internship approved by The American Dietetic Association; or any member of the Association.

2. Essays shall be typed in triplicate, double spaced, and shall not be less than 15 or more than 20 pages in length, exclusive of references.

3. Essays accompanied by separate vita of contestant shall be received by the Executive Secretary on or before June 1 of each year.

4. All essays shall become the property of The American Dietetic Association, with publication rights in the JOURNAL or elsewhere as the Association deems advisable.

5. Essays shall be judged by a committee of three persons, to be appointed by the Executive Board of The American Dietetic Association. The names of the judges shall not be made public.

6. Essays shall be judged on the basis of original investigation and interpretation of source material; coverage of subject and final conclusion; and on organization, literary style, and documentation.

7. The decision of the judges shall be final. No award shall be made in any year that the judges consider no essay merits an award.

8. The Award shall be presented at the Annual Meeting of The American Dietetic Association or other occasion designated by the Executive Board.

AWARD RECIPIENTS

The first recipient of the Lydia J. Roberts Essay Award was Felisa J. Bracken, who received in 1952 the $500 honorarium for her essay on "Infant Feeding in the American Colonies." This essay was published in the April 1953 issue of the JOURNAL. Winner in 1953 of the Award was Dorothy Lefebvre Jefferson, whose essay on "Child Feeding in the United States in the Nineteenth Century" was chosen as best by the judges. This essay will appear in an early issue of the JOURNAL.

A. D. A. LOAN FUNDS

To encourage graduate study in the field of nutrition and dietetics, The American Dietetic Association maintains a Loan Fund for Graduate Study. Members planning to enroll in graduate schools are urged to make use of this fund. Policies concerning these loans are as follows:

Eligibility: Any person who has been an active

member of The American Dietetic Association for at least two years and wishes to pursue graduate study leading to an advanced degree may apply for a loan. No more than three applicants from any one state or territory can be considered.

In 1952, the Awards, Scholarship and Loan Fund Board adopted a new policy, making home economics graduates about to enter approved dietetic internships eligible for loans, if funds in the Graduate Loan Fund exceed by a wide margin the demands of members seeking assistance for graduate study.

How and When to Apply: Applications for loans should be made on special forms available from the A.D.A. office in Chicago. Application must be accompanied by full credentials, including transcript of college credits, photographs, letters of reference, and a personal letter stating plans for graduate work, time and place contemplated, degree sought, and future plans. Applications must be endorsed by a state officer or delegate, and by one other Association member familiar with the applicant's professional work.

Special regulations pertaining to dietetic interns applying for loans may be found on page 35 of the *Annual Reports and Proceedings 1951–1952, The American Dietetic Association.*

Amount of Loans, Interest Repayment, and Security: Loans for graduate study in any amount up to $1000 may be made to qualified applicants, the total loans or installments to be adjusted according to circumstances. Loans to dietetic interns shall not exceed $500.

Interest on loans shall be charged at the rate of 2 per cent annually, beginning one year from the date of the loan. Repayment of principal should be made as soon as possible to allow other members of the Association to benefit from the loan privilege. It is expected that all loans will be repaid within three years from the date of the loan.

Security for loans may be provided by promissory notes. Loans made to dietetic interns are to be cosigned by a responsible person, or may be secured by a life insurance policy naming A.D.A. as the beneficiary. Terms of loans may not be uniform, but may vary according to the facts in particular cases, as the administering authorities may deem advisable.

Selection of Loan Recipients: Final selection of recipients will be made according to qualifications of applicants and need, as judged by the Awards, Scholarship and Loan Fund Board of the Association. The names of applicants and recipients of loans may be kept confidential if so requested.

M. FAITH MCAULEY MEMORIAL LOAN FUND

Contributions from members of the Illinois Dietetic Association totalling approximately $1200 have been turned over to The American Dietetic Association to establish the M. Faith McAuley Memorial Loan Fund to help dietitians doing graduate work in food administration.

Applications for use of the M. Faith McAuley Memorial Loan Fund may be obtained from the Executive Secretary, The American Dietetic Association. Regulations governing the granting of loans from this fund are similar to those listed above for the general Loan Fund.

Revised Placement Bureau Procedures

In accordance with the wishes of the members of The American Dietetic Association, the Executive and Placement Bureau Boards are happy to announce that the Placement Bureau procedures have been changed as follows:

1. Discontinuance of the placement fee as of October 15, 1953.
2. Institution of a monthly *Placement Bureau Bulletin.*
   a. The *Bulletin* will list individual openings at no cost to the employer. Situation wanted notices, open or coded as the individual desires, may be inserted at the rate of $1.00 per insertion by members of The American Dietetic Association *who are registered with the Placement Bureau.*
   b. This *Bulletin* will be sent at a charge of $1.00 per copy to members of the Association interested in knowing of openings and to employers seeking applicants. If you are interested in receiving the *Bulletin* (the first copy is available November 1), send your name and address and check or money order to:

Placement Bureau
The American Dietetic Association
620 North Michigan Avenue
Chicago 11, Illinois

3. Registration with the Placement Bureau is still optional, and a fee of $2.00 will continue to be made for new registrants. When a member is registered in the Placement Bureau, she may have her credentials sent to prospective employers.
   a. If a member now registered wishes to bring her credentials up to date, a charge of $1.00 will be made for this service.
4. Personal interviews may still be arranged.

Current Comment

PSYCHOPHYSIOLOGY IN FOOD ACCEPTANCE RESEARCH[1]

HOWARD G. SCHUTZ and FRANCIS J. PILGRIM, PH.D.

Acceptance Division, Food and Container Institute for the Armed Forces, Chicago

People like and eat foods, but not all foods, nor yet some foods at all times. It therefore becomes important in purchasing food or in planning meals for large groups to know something about what foods are liked and how well. Food acceptance research already can determine empirically how many people like a certain food or how well. But to increase the effectiveness of this planning, particularly for specialized or abnormal conditions, we must know *why* people like foods and *when* and even *where*.

Psychophysiology provides the approach which satisfies the criteria of a scientific method and will give the required information about behavior. Just as the word implies, psychophysiology combines psychology and physiology. It is the study of the physiologic mechanisms underlying behavior. Using the methods of this discipline we can determine the rules which govern our behavior. Knowing the "rules of the game" we can hope eventually to predict how a person will react to stimulation from his environment. What kinds of information will psychophysiology give us with regard to foods? Some of the major problems which it can help solve are revealed by these questions: (a) What are the characteristics of the basic tastes and odors and how are they interrelated? (b) How do these, along with other senses such as touch and temperature, combine to make up what we call flavor? (c) What are the basic physiologic and psychologic mechanisms producing hunger, appetite, and thirst? (d) What effects do unusual environments—the stress of battle, monotony of scene, climatic extremes—have on food preferences?

In determining characteristics of taste and odor qualities and their interrelationships, . . . the three important measures that apply to studies of foods are the absolute threshold, the difference threshold, and the point of subjective equality. Since the sensitivity of a person varies within limits from moment to moment, the thresholds as traditionally measured represent a statistical average that is reasonably constant for a given set of conditions.

The psychophysical methods represent one set of tools. They are employed in measurements relating directly to odor and taste or flavors. Some of the other useful tools are borrowed from other fields, such as neuroanatomy, physiology, biochemistry, and endocrinology. Their use is best illustrated by the problems of appetite, thirst, and stress.

In the general area of sensory physiology, one aspect of the problems bearing on differential sensitivity to the basic tastes is the comparison of the DL (difference limen) in water with the DL in a complex flavor represented by a food. This comparison has already been made for two of the taste qualities.

The DL for salt was determined in a plain water solution and in a commercial tomato juice. Results show that the DL for salt is higher in the tomato juice, that is, people could not detect as small a difference in salt concentration in the food as they could in water. A different result was obtained in the other experiment where the DL for sugar was determined in plain water and in an orangeade. Here the DL was lower for the sugar in the orangeade.

This kind of information, when known for all four of the basic tastes in a number of representative foods, is valuable for several reasons. In the formulation of foods it defines the limits of variability or the amount of change that may be deliberately introduced without the difference being detected flavorwise. The study of salt in tomato juice indicates that certain changes may be masked. On the other hand, the study of sugar in the orange flavor points up a different phenomenon. Some other component, perhaps the acid, has facilitated the discrimination. This emphasizes that we cannot always apply the results obtained with pure substances to food problems. Beyond the immediate practical value of the information, such studies give clues to the way people discriminate and judge flavors.

The interactions that alter discrimination suggest another area of study—the subjective strength of tastes and odors. We usually sweeten very sour substances, such as lemonade. How much does a given amount of sugar reduce the sourness of acid? To food technologists, especially those who are attempting to satisfy some of the unusual demands of military feeding, the answers can have a practical significance. For example, if salty or acid substances can improve the preservation of a food, but the resulting flavors lower its acceptability, can we hope to counteract the undesirable flavor of too much saltiness or sourness with another taste?

Another problem is highlighted in the following experiment. Everyone has on some occasion been

[1] Condensed and reprinted with permission from Activities Report, Vol. 4, No. 3 (Third Quarter), 1952.

how nonfat dry milk meets the Dietitian's needs...

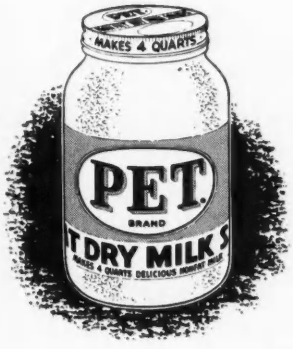
FOR APPETIZING BEVERAGES...

HIGH PROTEIN – LOW FAT

When diets call for *more* of milk's body-building protein, but less fat . . . nonfat dry milk provides the ready answer. It is fresh pasteurized milk with water and fat removed, supplying *all* the bone-and-muscle-building nourishment with only about half of the calories of whole milk.

For delicious, nourishing beverages that are high in protein, low in fat, Pet Nonfat Dry Milk offers these definite advantages:

- ✓ Produced by a special low-heat process to retain delicious fresh-milk flavor.
- ✓ Packed in glass for extra protection.
- ✓ Mixes easily in cold water.
- ✓ Cost is surprisingly low.



EGG NOG

(recipe for 1 serving)		(analysis)	
Put into bowl.....	1 egg ¾ cup water 1½ tsp. sugar ¼ tsp. vanilla	PROTEIN	15.42 gms
		FAT	6.26 gms
Sprinkle over top and beat with rotary beater until well blended....	3 tablesp. PET NONFAT DRY MILK	CHO	20.79 gms
		CALORIES	201

PRODUCT OF PET MILK COMPANY • MAKERS OF AMERICA'S FIRST EVAPORATED MILK

aware of the significant effect that odor has on the over-all attitude toward food; however, the actual role that the stimulation of the odor sense has on the ability to taste is still a matter for scientific inquiry. To test this relationship, an experiment was designed in which the threshold for a basic taste quality (sour) would be determined in a relatively odor-free environment, and then for this same taste quality while the subject was being stimulated by a pleasant odor. The odor and taste were presented simultaneously.

The results indicated the existence of a complex relationship between the odor and taste that were used. Those subjects who had high thresholds (i.e., could detect sour only at high concentrations) without odor had lower thresholds with the addition of odor. Conversely, those who had low thresholds (i.e., could detect sour at low concentrations without odor) had raised thresholds under odor stimulation. Those subjects who had moderate thresholds without odor had no change during odor stimulation.

This experiment points out quite vividly the necessity of having a large enough group of subjects in work that involves sensory determinations. If it had not been for the size of the group tested, the complex relationship might have gone undetected. The results from two or three or even five people cannot be applied to people in general with any degree of validity. This holds equally true for the determination of attitudes toward food. Certainly the attitudes of a few select, so-called experts cannot represent the variability that exists in food attitudes.

Studies of thresholds serve more purposes than providing information about flavors. For example, it had been found that an individual's sensitivity to odors and tastes varies with his degree of hunger. A hungry person is more sensitive than one who has recently eaten and feels satiated. This finding is important because it contributes to a knowledge of the physiologic correlates of appetite and satiety, a field of inquiry where data are yet rather meager.

We have found out that certain condiments promote appetite and produce lower thresholds. Are there also specific substances in foods that produce satiety? We are exploring this unknown for if such substances exist in some foods, we may want to put them in others. It scarcely need be emphasized that satiety has a distinct influence on morale.

Closely related to appetite is thirst. In desert operations and under survival conditions, water deprivation may occur. Can we alter patterns of behavior relating to water consumption? To find out what regulates thirst and water intake, as well as some of the factors regulating appetite and satiety, we turn to neurophysiology.

It is known, for example, that if a certain part of the hypothalamus is destroyed, an animal will overeat and become obese; on the other hand, destruction of an adjacent area causes cessation of eating to the point where the animal starves to death. We seem to have here an appetite center. We need to learn whether it is influenced by the level of nutrients in the blood, by food in the stomach, or by other as yet unknown factors. That is, we want to know what mechanisms cause a person to eat or drink, and further, what terminates this eating behavior before the required nutrients are absorbed from the digestive tract. Is there a "satiety mechanism" independent of the hunger mechanism? Some of the studies on thirst seem to indicate that there are multiple cues to the initiation and cessation of drinking behavior.

It is necessary to find out what happens to food acceptance and preferences under various kinds of stress. Some animal studies have been conducted in this area, but human studies are just beginning. The experimental plan for one investigator is to develop stress in human subjects through forced lack of sleep and to measure changes in food preferences. First the preferences for levels of sugar and salt in certain foods will be studied. This is not an arbitrary choice; sugar represents energy; salt metabolism is regulated by the adrenal glands which are always activated by stress. Hence it is useful to know if the body attempts to adjust to changed requirements through the sense of taste. If it does, it may be reflected in the preference for certain foods, and we must provide the foods that will permit the optimum adjustment to any situation.

Satisfying Patients in the Small Hospital

Sturgis (Michigan) Memorial Hospital with only seventy beds, is too small for a selective menu to be practical. However, a system permitting partial selection occurred to Josephine Hutchison, the dietitian "shared" by Sturgis and Three Rivers Hospitals. Mrs. Hutchison felt it would be possible to have patients indicate their preferences for certain foods which are a part of every meal.

A printed slip was prepared and is now sent to every patient with his first full tray. On this slip the patient checks his choice of bread and beverage for all three meals.

Mrs. Hutchison comments: "In a study done before starting this plan we found that if the patient received a choice of these items he was better satisfied with the rest of his food. For another period, we added other foods, such as salad and salad dressing. So few checked their preferences that we discontinued placing these other items on the slip.

"Patients on therapeutic diets receive a preference slip listing the items allowed. We have had a good response from the patients and find that calls to the kitchen for changes of beverages, etc., have been cut to a minimum."

—*From: The Bulletin of the Michigan Dietetic Association, Spring, 1953.*

In special diets— recipes make the difference

Dull appetites perk up

...your recommendations are more enthusiastically followed — if your special-diet patients have menus that are as appetite-stimulating as they are wholesome. The use of Gerber's Strained or Junior (Chopped) Foods, as indicated—plus the help of "Recipes for Special Diets"... makes the combination feasible for Bland, Soft, Mechanically Soft, Liquid, and Low-Residue Diets.

The tempting true color and true flavor of Gerber's great variety, along with high nutritive values, fine texture, and bland seasoning—all combine for diets equally satisfactory to you and your patients.

ACCEPTED COUNCIL ON FOODS AND NUTRITION AMERICAN MEDICAL ASSOCIATION

DINNER MENU

(based on recipes from Gerber's "Special Diet" booklet)

Cream of Vegetable Soup.....(pg. 16)
Mock Chicken Legs.....(pg. 24)
Squash Custard*.....(pg. 20)
Fruited Rice Pudding.....(pg. 33)

*** SQUASH CUSTARD**

2 containers Gerber's Strained Squash
¼ cup orange juice — 3 Tbs. sugar
1 egg — Salt

Combine ingredients. Bake in oiled baking dish or 3 custard cups for 35 mins. in moderate oven (350°).

Gerber's

4 CEREALS • 50 STRAINED AND JUNIOR MEATS, VEGETABLES, FRUITS, DESSERTS

FREE COPIES of Gerber's "Recipes for Special Diets!" Write on your letterhead to Dept. 2311-3, Fremont, Michigan.

Book Reviews

Score Your Diet. By Miriam E. Lowenberg, Ph.D., Mildred Mouw, R.N., Laura Weyrick Hoeft, R.N., and Dolores Nyhus. Ames, Iowa: The Iowa State College Press, 1953. Paper. Pp. 16. Price 35 cents.

This booklet is a device for quick scoring of the diet. The Recommended Dietary Allowances of the National Research Council are included. Values are taken from "Food Composition Table for Short Method of Dietary Analysis (2nd Revision)" by Jane M. Leichsenring and Eva Donelson Wilson (J. Am. Dietet. A. 27: 386, 1951). Food values are expressed in units to eliminate the use of decimal points. Foods are grouped into four categories: (a) milk, meat, fish, eggs, and cheese; (b) fruits and desserts; (c) vegetables; and (d) cereals, fats, sweets, and other foods. All four categories added to give the day's nutrient content.

As with any table of this kind, the sizes of servings will not be in accordance with all areas of the country. For example, six servings of meat per pound would not be considered a medium serving of meat by many people. It would be of interest to know for whom the booklet was written. A lay person would find many items missing. For example, rice, which is a good staple in certain sections of the country, is not listed. Spaghetti and macaroni are also missing. A person trained in foods would be able to interpolate some of the items, but an untrained person would have difficulty. The book is nicely arranged and convenient to use.—*Martha F. Trulson, D.Sc., Assistant Professor of Nutrition, Harvard School of Public Health, Boston.*

Man's Foods. By Lloyd B. Jensen, Ph.D. Champaign, Illinois: The Garrard Press, 1953. Cloth. Pp. 278. Price $4.50.

This is the story of man and his foods. The book is divided into two parts; the first four chapters deal with food-gathering times while the last eleven chapters are concerned with food-producing times. The author has listed more than six hundred references.

Covering the period of time from the Paleolithic epochs to the close of classical times, the author traces the growth of man from a food-gatherer who "tightened his waist band in times of scarcity" to the modern food-producer who "often tightens his waist band by overeating." The first few chapters of the book are difficult reading for one not versed in anthropology.

There is much conjecture throughout the book on the role of food in the evolution of man; however, evidence is presented showing the superiority of man when food was abundant and nutritionally complete, all of which excites the imagination to the part food might possibly play in the future destiny of man.

Modern basic nutrition information is summarized, and these facts are related to man's food through the ages, stressing the importance of food on man's physical, emotional, moral, and social growth. Foods selected by earliest man, both by choice and necessity, were often nutritionally sound as judged by today's standards. One is impressed by the fact that there is little animal or vegetable matter that has not been used by man for food at some time.

The chapters dealing with social aspects and effect of climate on man and his food will be of value to the dietitian and nutritionist. This book will have interest for the physician, biochemist, microbiologist, and agriculturist and will give the nutritionist a broad general perspective of food through the ages and its influence on man's development.—*Hellen Linkswiler, Ph.D., Research Laboratory of Human Nutrition, University of Alabama, Tuscaloosa.*

Food-Borne Infections and Intoxications. 2nd edition. By Fred W. Tanner, Ph.D., and Louise P. Tanner, Ph.D. Champaign, Illinois: The Garrard Press, 1953. Cloth. Pp. 769. Price $12.

The book is a thorough discussion of food-borne poisonings, the organisms causing the poisoning and their characteristics, as well as illnesses caused by the organisms. There is one chapter in which ptomaines and ptomaine poisoning are discussed; another is devoted to viruses and their relation to illness; and a third is concerned with metals in foods and their possible relation.

The subject matter is treated in detail. The wealth of material is simply stated and does not give way to boring reading. The Table of Contents is most informative, listing the subtopics of each chapter with the page number. The authors use many illustrative cases and record experiments concerned with various organisms.

Written to supplement the discussions in the senior author's *The Microbiology of Foods*, this text can serve as excellent supplementary and reference reading in courses on food microbiology and sanitation.

The authors, being well known authorities, have written a book which is of value to the layman as well as the researcher.—*Julie Raney, Dietetic Intern, Ohio State University Hospital, Columbus.*

RECENT BOOKS RECEIVED

How to Save Money and Eat Better. By Harriet Jean Anderson. New York: Rudolph Field Co., 1953. Cloth. Pp. 61. Price $2.

Individual and Community Health. By William W. Stiles, M.D., M.P.H. New York: The Blakiston Company, 1953 Cloth. Pp. 492. Price $6.

Plant Proteins in Child Feeding. By R. F. A. Dean. Privy Council, Medical Research Council Special Report No. 279. London: Her Majesty's Stationery Office, 1953. Paper. Pp. 164. Price $2.25.

Manic-Depressive Disease. By John D. Campbell, M.D. Philadelphia: J. B. Lippincott Company, 1953. Cloth. Pp. 403. Price $6.75.

Plant Diseases. The Yearbook of Agriculture, 1953, U. S. Department of Agriculture. Washington: Government Printing Office, 1953. Cloth. Pp. 940 + 32 pp. color plates. Price $2.50.

Current Research on Vitamins in Trophology. Nutrition Symposium Series No. 7. New York: The National Vitamin Foundation, Inc., 1953. Paper. Pp. 155. Price $1.50.

Peptic Ulcer. By Lucian A. Smith, M.D., F.A.C.P. and Andrew B. Rivers, M.D., F.A.C.P. New York: Appleton-Century-Crofts, Inc., 1953. Cloth. Pp. 576. Price $12.50.

Protein Metabolism, Hormones and Growth. A Symposium. New Brunswick, N. J.: Rutgers University Press, 1953. Paper. Pp. 80. Price $1.50.

The Chef's Perpetual Menu-Planner. By Clyde Bedell. Chicago: Swift & Company, 1953. Paper. Price $5.

Meat...

and Its Place in the Diet in Hypertension

Contrary to the concept that protein intake contributes to the genesis of hypertension and should be drastically reduced in therapy[1, 2, 3] adequate protein nutrition today is considered essential for preserving maximal vigor and a sense of well-being in the hypertensive patient.[3] Meat, once thought to be contraindicated, now is recognized as an important protein food in the dietary regimen in hypertension.

High-protein foods do not elevate arterial tension—neither in the hypertensive nor the normotensive person. Nor does the specific dynamic action of protein make undue demands on the heart.[2, 3, 4] Only in advanced hypertension when renal function is seriously impaired, or in cardiac emergency episodes, when cardiac disease complicates hypertension, is restriction of protein intake below the normal allowance of 60 to 70 Gm. per day justifiable.[2, 3]

But not only for its high content of biologically top-quality protein is meat a recommended daily food in the diet of the hypertensive patient. It also goes far toward satisfying the needs for essential B vitamins and minerals. Another important feature of meat is its outstanding taste appeal and its virtually complete digestibility.

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1. Wilhelmj, C. M.; McDonough, J., and McCarthy, H. H.: Nutrition and Blood Pressure, Am. J. Digest. Dis. *20*:117 (May) 1953.
2. Mann, G. V., and Stare, F. J.: Nutritional Needs in Illness and Disease, J.A.M.A. *142*:409 (Feb. 11) 1950.
3. McLester, J. S., and Darby, W. J.: Nutrition and Diets in Health and Disease, ed. 6, Philadelphia, W. B. Saunders Company, 1952, pp. 519-524.
4. Levine, V. E.: The Blood Pressure of the Eskimo, Federation Proc. *1*:121 (Mar. 16) 1942.

The Seal of Acceptance denotes that the nutritional statements made in this advertisement are acceptable to the Council on Foods and Nutrition of the American Medical Association.

ACCEPTED COUNCIL ON FOODS AND NUTRITION AMERICAN MEDICAL ASSOCIATION

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Current Literature

Contributed by Janette C. Carlsen and Ethel M. Miller, The Johns Hopkins Hospital, Baltimore; Mary L. Majerus, Dietetic Intern, Veterans Administration Center, Los Angeles; Elizabeth H. Tuft, Wesley Memorial Hospital, Chicago; Margene A. Wagstaff, Warrenville, Illinois; and the Journal staff

AMERICAN JOURNAL OF PUBLIC HEALTH

Vol. 43, August, 1953

* Some basic considerations of obesity as a public health problem. N. Jolliffe.—p. 989.
* Benefits of reducing. L. I. Dublin.—p. 993.
* The group approach to weight control. M. J. Ford.—p. 997.
* Newburgh-Kingston caries fluorine study. V. Pediatric aspects—continuation report. E. R. Schlesinger, D. E. Overton, and H. C. Chase.—p. 1011.

Obesity—A Public Health Problem. Life expectancy at age forty is less in the U. S. than in sixteen other countries. Many believe that degenerative diseases form the core of our newer health problems, and mortality figures show that the obese die earlier of the degenerative diseases than do the nonobese. Chief of the degenerative diseases is arteriosclerosis. During the last half-century obesity has, in all probability, increased. This is due to the fact that the per capita consumption of calories has remained constant at around 3100 calories a day since 1900. During this time the population at age forty-five and over has increased by more than 10 per cent (the need for calories decreases with age), and there has been a significant decrease in average energy expenditure since 1900. It is reasonable to assume that 2870 calories per capita would compare today with the average of 3100 calories consumed earlier in the century. In addition to a discussion of the above statements, the article includes summaries of basic information concerning the etiology and treatment of obesity. Stress is placed on education of the obese patient in elementary dietetics; that is, learning the energy value of foods in terms of standard portions.

Benefits of Reducing. A study of the benefits of reducing has been made by the Metropolitan Life Insurance Company. A general study, covering a period of twenty-five years, was made of 25,000 men and 25,000 women who were charged an extra premium solely because they were overweight. The analysis revealed nothing startlingly new. However, a separate study was made of those overweight persons who, on a later application for insurance, showed a reduction in weight sufficient to qualify them either for standard insurance or a lower rating than they had been given originally. It was found that among both men and women, the death rate after weight reduction was substantially less than that recorded for all the overweight people studied. The reduction among men was about one-fifth; among women, about one-third. Several studies are cited in which definite physical signs of diseases associated with overweight were improved as a result of weight reduction.

Group Approach to Weight Control. A Conference on the Group Approach to Weight Control was held in Washington, D. C., in June, 1952. The results of this Conference are reported. It was the opinion of the group that all such programs should be under general medical guidance and close professional supervision. Weight control groups should be somewhat homogeneous in terms of age, background, and degree of overweight of the participants. About ten or twelve seemed to be the ideal size of the group. Some form of psychologic screening was recommended to eliminate those who are not likely to benefit from a group experience and persons with severe psychologic problems who are likely to hamper the progress of the group. Sessions should last 1 hr. and be held once a week. The total number of meetings depends on circumstances. If the "open" method is used, the group itself operates continuously although its composition changes as new members join and old ones drop out. In the "closed" type, a group is organized to accomplish a stated aim in a definite number of sessions (usually sixteen) and to disband at that time. The qualifications of the group leader are discussed, and the content of the sessions is considered.

Newburgh-Kingston Caries Fluorine Study. Reported in this article are the findings of the pediatric examinations of the children studied in Newburgh and Kingston, New York, over a period of six years since the introduction of fluorine in the Newburgh water supply. The children ranged in age from three to fourteen years. No significant deviations were found in either group as a result of physical examinations which included measurements of height and weight, selected laboratory tests, and roentgen studies. The Newburgh-Kingston study will continue for the full ten years; however, there is no reason to anticipate any systemic effects resulting from the fluoridation of the drinking water in Newburgh.

ANNALS OF INTERNAL MEDICINE

Vol. 36, August, 1953

The relationship of chronic ulcerative colitis and cirrhosis. F. W. Hoffbauer, J. S. McCartney, C. Dennis, and K. Karlson.—p. 267.

Disease of liver associated with ulcerative colitis. J. A. Bargen.—p. 285.

ARCHIVES OF INTERNAL MEDICINE

Vol. 92, August, 1953

* Fat-loading studies in relation to age. J. Herzstein, C.-I. Wang, and D. Adlersberg.—p. 265.

Fat-Loading Studies in Relation to Age. Two groups of fasting subjects were given a test meal of 40 per cent cream, to provide 1 gm. fat for each kilogram of body weight. The mean ages of the groups were 24.9 and 62 years. After 2 hr. the mean rise in total serum lipids for both groups was the same. However, the concentration of total lipids in the serum of the younger group fell almost to the fasting level by the sixth hour, while the older group continued to show a higher level for the 24-hr. period.

BRITISH MEDICAL JOURNAL

No. 4831, August 8, 1953

* Breast-feeding in the Oxford Child Health Survey. A. Stewart and C. Westropp.—p. 305.

No. 4833, August 22, 1953

* Dietary "fiber" and pregnancy toxemia. E. H. Hipsley.—p. 420.

Breast-Feeding in Oxford. The early progress of 580 babies in the Oxford Child Health Survey has been studied in relation to feeding habits. At the age of one year, the babies who were bottle-fed from the beginning were appreciably heavier than the babies who were completely breast-fed for five months or longer. They also showed signs of being slightly more mature. It is suggested that these differences were due to minor degrees of underfeeding among the breast-fed babies. For three disease groups—gastroenteritis, bronchitis and bronchopneumonia, and otitis media and tonsillitis—there was no evidence that the duration of complete breast feeding influenced the over-all infection rates. Gastroenteritis was comparatively rare while the babies were receiving nothing but breast milk, but it reached its maximum incidence in the weaning period and was especially common among babies who began to be weaned in the sixth month.

Dietary Fiber and Toxemia of Pregnancy. The incidence of toxemia in pregnancy in various groups of women consuming widely different diets, together with observations of trends in the incidence in the same group of women but at different periods is discussed. The suggestion is made that some factor or factors associated with the fiber content of the diet tend to inhibit the occurrence of toxemia.

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CANADIAN JOURNAL OF PUBLIC HEALTH

Vol. 44, July, 1953

* The consumption of recommended foods by children in relation to sex, the use of sweet foods, and the employment of mothers. M. T. Doyle, M. C. Cahoon, and E. W. McHenry.—p. 259.

Consumption of Recommended Foods in Canada. A study of food use for one week of 444 urban children ages ten to fourteen years showed that large percentages had less than half the recommended amounts of milk, citrus fruit, vegetables, whole grain cereals, and vitamin D. Nearly all had sufficient meat. No significant difference in food intake was evident between girls and boys. Using arbitrary rating of the intake of sweet foods, a greater percentage of liberal users of sweet foods had satisfactory supplies of recommended citrus fruit and vegetables. The reported data do not support a contention that liberal use of sweet foods lessens the intake of other foods. The percentage of children with unsatisfactory supplies of recommended foods was not increased appreciably by the regular out-of-home employment of the mothers.

CEREAL CHEMISTRY

Vol. 30, July, 1953

* The albumin and globulin proteins of wheat. J. W. Pence and A. H. Elder.—p. 275.
* The thiamine content of Turkish wheats and corresponding bulgurs. S. Saracoglu.—p. 323.

Wheat Proteins. Results of a recent study of water-soluble wheat proteins yielded more reliable criteria of identification of the several protein components than heretofore. Soluble proteins of wheat were formerly classified as albumin or globulin primarily by solubility characteristics. It seems reasonably certain from this study that the major components of the albumins and globulins have been detected. Other components, such as pentosans, did not occur in sufficient amounts to alter the character of the two main groups. The amide-nitrogen and tryptophan contents of the individual major components were found not to differ materially from average values already obtained. Therefore, these two features of composition are being used to estimate the total albumin and globulin contents of flours. Additional findings are presented.

Turkish Wheat. Bulgur, a wheat product resembling dark rice, is Turkey's main food along with flour and bread. A study of the thiamine content of the various wheat forms has been made. Wheat, it was found, underwent an average thiamine loss of 27.3 per cent through conversion into bulgurs. Suggestions are given for obtaining bulgur with high thiamine content, i.e., care to avoid lowering the content during preparation, or subsequent enrichment of the low-content bulgur. The possibility of an enrichment procedure is being investigated.

FOOD RESEARCH

Vol. 18, July–August, 1953

* Production, uses, and composition of foods of plant origin from Ecuador. H. E. Munsell, R. Castillo, C. Zurita, and J. M. Portilla.—p. 319.
* Relationship of shell egg quality and performance of egg white in angel food cakes. J. V. Harns, E. A. Sauter, B. A. McLaren, and W. J. Stadelman. —p. 343.
* Storage changes in the phosphorus, nitrogen, and fatty acid constituents of the lipid in canned Florida Valencia orange juice. C. W. Huskins and L. J. Swift.—p. 360.
* Acetaldehyde and related compounds in frozen green peas. J. J. David and M. A. Joslyn.—p. 390.

Ecuadorian Plant Foods. Data are presented on the composition of 131 samples of Ecuadorian foods of plant origin, representing seventy-five food items. The samples were analyzed at the National Institute of Nutrition in Quito for moisture content, ether extract, crude fiber, nitrogen, ash, calcium, phosphorus, iron, carotene, thiamine, riboflavin, niacin, and ascorbic acid. Values are compared with those for similar foods from Central America. Data presented appear to indicate that in content of the nutrients determined, the foods of Ecuador compare favorably with similar foods grown elsewhere. There seems to be, therefore, no justification for the familiar statement that the country's fruits and vegetables are "deficient."

Egg Whites in Angel Food Cakes. Albumen index is closely related to angel food cake quality, according to a study of the effect of egg storage conditions on the performance of egg whites in the cakes. Cakes were found more satisfactory if the candled and broken out qualities of the eggs were high. Cold storage temperature and controlled humidity maintained egg quality sufficiently to produce satisfactory cakes for six months under the conditions of the study. When eggs were stored at room temperature, the scores of the taste panel decreased in inverse ratio to length of storage. Off-odors developing in eggs during storage, although noticeable in preparation, were usually not detectable in the baked cakes.

Lipids in Orange Juice. Analyses were made of the lipid from pasteurized, stored Valencia orange juice. The study was undertaken to determine the rapidity of changes in the phosphorus, nitrogen, and fatty acid constituents during storage under normal climatic conditions in Winter Haven, Florida. Fatty acids of the lipid underwent much less drastic changes than did the phosphorus- and nitrogen-containing parts of the phosphatides. It was found during a year's time that a considerable loss of nitrogen, particularly choline nitrogen, from the lipid fraction had taken place. Approximately half the phosphorus was lost, mostly during the first six months. Owing to the loss of those portions of the phosphatides associated with the nitrogen and phosphorus, an over-all increase occurred in the percentage of fatty acids.

Carbonyl Compounds in Peas. Acetaldehyde, ethanol, and other carbonyl compounds were found in varying degrees in the steam distillate of: fresh peas, fresh peas subjected to anaerobiosis, and peas frozen and stored since 1937. Ethyl alcohol was the only alcohol found in the steam distillate of peas.

FOOD TECHNOLOGY

Vol. 7, July, 1953

Factors in the selection and design of a spray dryer. R. Laster.—p. 264.

* The effect of sweetened and unsweetened foods on stainless steel cooking utensils. J. H. Cason and C. F. Poe.—p. 271.
* Quality and nutritive properties of different types of commercially cured hams. III. Vitamin content, biological value of the protein and bacteriology. C. F. Dunker, M. Berman, G. G. Snider, and H. S. Tubiash.—p. 288.

Acid Juices and Stainless Steel. The corrosive effect of unsweetened canned fruit juices, to some of which sucrose or glucose had been added, was determined on stainless steel cooking utensils. The amount of iron dissolved was found to vary inversely with the sugar content of the juice. More iron was dissolved than chromium or nickel, in relation to the amount of these elements in the stainless steel. Very little chromium was dissolved; however, the sugar retarded somewhat the juice's corrosive effect on the utensils. No measurable amounts of nickel were dissolved. The acidity of the juice showed little relation to the corrosive effect. Amounts of iron, chromium, or nickel dissolved were not believed great enough to cause concern from a health standpoint.

Cured Hams. Four types of commercially cured hams were analyzed for vitamin content, biologic value of the protein, and bacteria. Commercial ham curing methods appeared to have little deleterious effect on vitamin content (such hams are good sources of certain B vitamins) or biologic value (nitrogen retention approximated 90 per cent). These methods appeared to produce bacteriologically safe products.

JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY

Vol. 1, July 22, 1953

Dehydrated foods.

* Chemical aspects of dried fruits. P. H. Richert. —p. 610.
* Chemical changes in dehydrated milk during storage. H. Shipstead and N. P. Tarassuk. —p. 613.
* Protein efficiency. Improvement in whole yellow corn with lysine, tryptophan, and threonine. B. Sure.—p. 626.

Vol. 1, August 5, 1953

* Dehydrated foods. Chemical and histological properties of dehydrated meat. D. M. Doty, H. Wang, and E. Auerbach.—p. 664.

Protein amino acids, contents of vegetable leaf proteins. E. G. Kelley and R. R. Baum.—p. 680.

Vol. 1, August 19, 1953

* Packaging progress. C. L. Adcock.—p. 710.
* Foods evaluation. Sampling plan for nutrition research program on frozen fruits, juices, and vegetables. H. P. Schmitt and R. J. Jessen.—p. 730.

Chemical Aspects of Dried Fruits. The methods for dehydrating various fruits are reviewed. The fruits fall into three classes: those, such as pears, apples, Kadota figs, and clingstone peaches, which are picked green and dried after harvesting; those, such as grapes, plums, apricots, and freestone peaches, which are dried immediately after harvesting; and those, such as dates, most figs, and some plums, which

—to promote better health

TO promote better health, mere enactment of laws is insufficient. Experience has shown that effective education of the public in nutritional matters depends to a great extent on the dissemination of the principles of nutrition, food values and related subjects. If the public is properly educated, it will naturally prefer the *improved* staple foods over those which are lacking in good nutritional value.

THE practice of enriching or fortifying foods for better health is becoming more widespread. For example, enrichment of many cereal foods, the fortification of certain fruit and vegetable juices, and of margarine, are accomplished facts in the United States. The list lengthens because food processors know that, fundamentally, the most important factor in foods is nutritive value. So they are making their good foods better—to the benefit of millions of people.

THE firm of Hoffmann-La Roche has for many years pioneered in the production of vitamins for the food and other industries throughout the world. These vitamins, synthesized by chemists, are identical with those existing naturally and are manufactured on a large scale at a much lower cost than if they were extracted from natural sources. These are the vitamins that are used for flour and bread enrichment, the process which to a great extent restores important nutritional values which are unavoidably lost in the milling and processing of wheat when fine, white flour is produced. Rice, corn and other cereal grains are similarly restored and fortified.

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are partially dried before harvesting. Color changes have the greatest influence in determining the drying procedure for each fruit, but flavor and texture changes are also determining factors. The enzymatic and microbial activity which result from sun-drying, sulphur-dioxide treatment, blanching with steam or hot water, and long storage are described, and the chemical nature of the reactions, as far as known, is discussed. These chemical reactions have not been studied intensively, but more is known on how to avoid undesirable changes than is being applied commercially.

Effects of Storage on Dehydrated Milk. Chemical changes in dehydrated milk cause staleness, oxidized flavor, hydrolytic rancidity, and insolubility. Although the exact causes and the nature of the chemical reactions involved in the formation of these off-flavors are complex and partly obscure, enough is known to enable the manufacturer to control their development to some extent. The effects on flavor of the following factors are described: heat treatment of the milk before drying; deaeration of the milk before heat treatment; copper contamination from process equipment; homogenization; the method of drying; the original moisture content of the powder; the absorption of moisture during storage; the level of atmospheric oxygen in the package; and the storage temperature.

Corn Proteins Improved with Amino Acids. Since previous experiments had shown that the addition of threonine to polished rice and to milled and whole wheat had increased the protein efficiency of these grains, the effect of threonine on the proteins in whole yellow corn was investigated. Two Guatemalan varieties and one U. S. hybrid variety were studied by biologic assay. It was found that a marked improvement in the efficiency of the proteins in both types of Guatemalan corn resulted from the addition of 0.5 per cent threonine to the rations in the presence of lysine and tryptophan. However, a supplementary effect of threonine to the proteins of the U. S. hybrid corn was obtained only in the presence of lysine, tryptophan, and methionine. Threonine also produced a marked specific effect on the economy of food utilization. Since corn is the principal source of protein to many peoples of the world, the enrichment of corn meal with lysine, tryptophan, and threonine would be very desirable when these amino acids reach a stage of economic commercial production.

Dehydrated Meat. Since the end of World War II, study on dehydrated meat has been limited. Dehydration as a method of preservation is particularly desirable when food must be stored and transported in a limited space and under adverse conditions. Chemical and histologic studies made on dehydrated meat in the past fifteen years are reviewed and a new study is reported. Previously, only cooked ground dehydrated meat had been produced successfully. An attempt has been made to develop a method for making available dehydrated steaks and chops. When slices of raw beef were dehydrated at 65°C. under vacuum or at 70°C. in air, there was a reduction in muscle fiber diameter, disappearance of longitudinal striations, a decrease in distinctness of cross striations, "merging" of individual muscle fibers, and movement of potassium to the periphery of muscle fibers. The dehydrated slices did not rehydrate satisfactorily. Similar products were obtained when meat was cooked at 140°, 170°, and 200°F. A satisfactory product was obtained when slices of raw meat were completely frozen-dried, or partially frozen-dried and then dried at 45°C. under vacuum.

Packaging Progress. The author reviews recent technical progress in the various branches of the food packaging industry, taking into account improvements both in container materials and in processing techniques. New metal cans; glass containers; and paper, fiber, and plastic packages are described, and the following advances in processing are discussed: continuous-agitating, steam-pressure cooking; vacuum packing; refrigeration; quick freezing; dehydration; low-sodium and low-calorie processing; radiation sterilization; antibiotic preservation; and aseptic canning.

Foods Evaluation. The statistical sampling plan is presented which will serve as the basis for a research program to determine the nutritional values of forty-eight frozen foods. Frozen fruits, juices, and vegetables from 149 food plants throughout the U. S. will be tested during the 1953 and 1954 packing seasons.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Vol. 152, August 1, 1953

* Fluid and electrolyte balance in burns. E. Reiss. J. A. Stirman, C. P. Artz, J. H. Davis, and W. H. Amspacher.—p. 1309.

* Diabetes in a New Ergland town. H. L. C. Wilkerson and L. P. Krall.—p. 1322.

Vol. 152, August 15, 1953

* Food and preventive medicine. Editorials and Comments.—p. 1537.

Fluid and Electrolyte Balance in Burns. Contained in this article is a brief and critical review of some facts and speculations on the fluid and electrolyte shifts in the severely burned patient. Also presented is a regimen that has proved valuable in the treatment of a large number of patients. Although the volume and rate of fluid losses can be gauged with reasonable accuracy, the exact composition of fluid losses is as yet unknown and imposes serious handicaps in treatment. Burns involving 20 per cent or less of the body surface can be managed satisfactorily with oral administration of electrolyte solutions, supplemented by small quantities of electrolytes, intravenously. The authors give a formula to be used as a rough guide for therapy in cases of severe burns. In such cases clinical signs and symptoms govern fluid therapy after the first 48 hr. Because of the high urinary losses of potassium, administration of oral potassium solutions is advised beginning on the third day.

Diabetes in Oxford, Massachusetts. On the fourth anniversary of a study of diabetes made in Oxford, Massachusetts, a progress study was begun to determine the status of the diabetic persons originally discovered and to investigate the interim development of diabetes in selected groups. In the original study, seventy persons with diabetes were identified. Of this group, forty-seven are still living and were observed as to the method of control of diabetes, glycosuria and blood sugar, and serious illness or complications due to diabetes. Findings emphasized the original conclusion that there is a need in the community for improved control in persons with diabetes. Further study of seventeen individuals with unclassified glycosuria suggests that the allegedly harmless glycosurias may often hide incipient diabetes. The general conclusion of the study is that most of those who had diabetes still have the disease, and that it has progressed in the past four years.

Food and Preventive Medicine. Study of today's health problems indicates the complexity and scope of modern nutritional practices. Today the problems are not so much in diseases such as pellagra, beriberi, and scurvy but with "conditioned deficiencies," such as diabetes mellitus, colitis, peptic ulcer, and anemia. Also of importance are the diseases in which fever plays a prominent part, there being an increased demand on some nutrients because of increased metabolism. Another concern lies in diseases of the gastrointestinal tract, where absorption as well as utilization of nutrients must be considered. Elvehjem has pointed out the interrelation of enzymes of the liver, amino acids, and disease. Information from his work should guide the physician in warning his patients against unnecessary and possibly dangerous self-prescribing of vitamins, protein supplements, and amino acid preparations. Still another problem enters the picture, in relation to our older population. In providing nutritional help for the aged, one must combat the claims of food faddists. All in all, nutrition today has many interesting aspects and it is important that present knowledge be applied as widely as possible.

THE JOURNAL OF CLINICAL NUTRITION

Vol. 1, May-June, 1953

* Iron deficiency in infancy and childhood. N. J. Smith and S. Rosello.—p. 275.

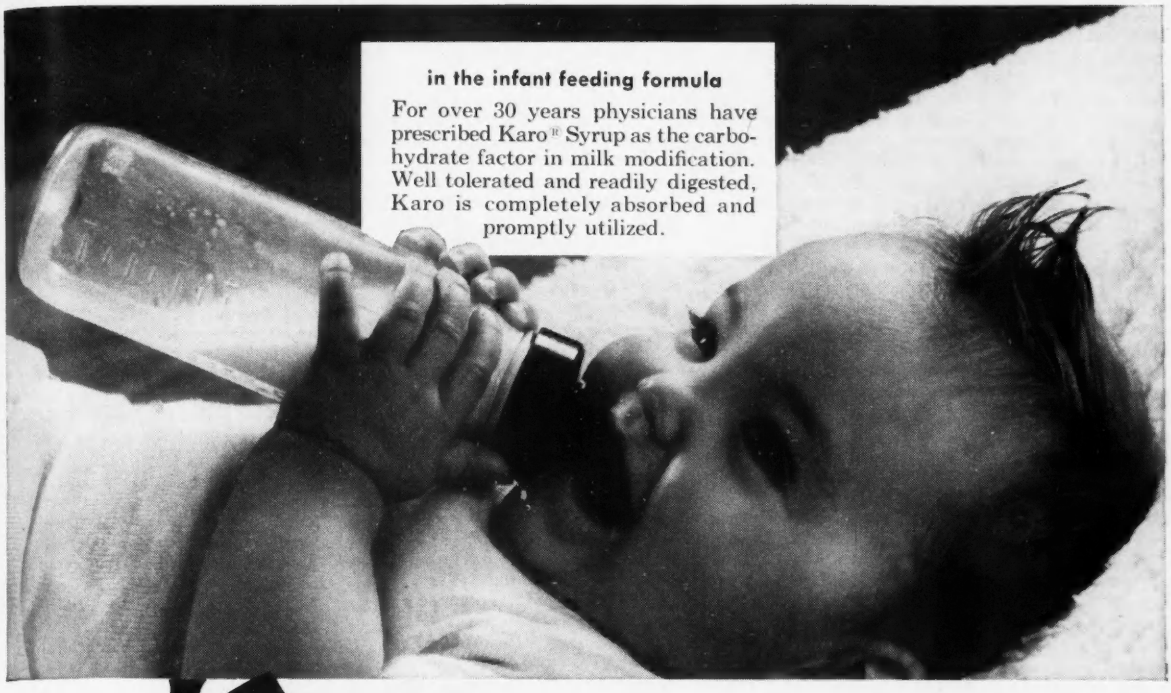
* Time factors in the utilization of a mixture of amino acids (protein hydrolysate) and dextrose given intravenously. R. Elman.—p. 287.

Dietary modifications of plasma cholesterol and phospholipid levels in diabetic patients. The effects of mixed diets high in vegetable fat. G. C. Cochrane, G. D. Michaels, and L. W. Kinsell.—p. 295.

Intravenous treatment of pernicious anemia with vitamin B_{12}. L. M. Meyer, R. McInerny, and N. D. Ritz.—p. 309.

* Planning the modern diabetic diet. D. Johnson.—p. 309.

Iron Deficiency in Children. The most common nutritional deficiency encountered in children is iron de-



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ficiency. In this study, 162 children were observed. Ages ranged from under six months to fifteen years; however, only twenty-one children were over four years old. The peak incidence of deficiency was found in infants ranging in age from nine to twenty-four months. The reasons for iron deficiency are discussed, and the laboratory findings and treatment are presented. A review of the present knowledge of iron metabolism is also given.

Factors Influencing Nitrogen Balance. Nitrogen balance studies on four patients given infusions of an inadequate mixture of glucose and amino acids were made. As a result, the existence of two time factors in the metabolism of amino acids given intravenously was shown. There was a greater utilization of amino acids when glucose was infused at the same time and when the mixture was infused at a slower rate. This study confirms observations made with oral feedings.

The Modern Diabetic Diet. Presented here is an over-all review of current methods of calculating the nutritional needs of the diabetic patient. The procedure used for planning the diabetic diet is the exchange system, worked out by a committee composed of representatives of A.D.A., the American Diabetes Association, and the Diabetes Branch, U. S. Public Health Service.

THE JOURNAL OF NUTRITION

Vol. 50, July, 1953

Effects of pantothenic acid deficiency on pituitary-adrenal function in the rat. B. H. Ershoff, R. B. A. Slater, and J. G. Gaines.—p. 299.

The vitamin B_{12} content of egg yolks as influenced by oral and parenteral administration of the vitamin. J. V. Halick, B. L. Reid, C. L. Brown, and J. R. Couch.—p. 331.

Agewise differences in the urinary excretion of vitamin B_{12} following intramuscular administration. D. M. Watkin, C. A. Lang, B. F. Chow, and N. W. Shock.—p. 341.

The effect of heat on the nutritive value of milk proteins as influenced by water and fat. L. J. Schroeder, M. Iacobellis, H. Lees, and A. H. Smith.—p. 351.

The relation of calcium-to-phosphorus ratio to the utilization of these minerals by 18 young college women. M. B. Patton, E. D. Wilson, J. M. Leichsenring, L. M. Norris, and C. M. Dienhart.—p. 373.

The influence of protein and certain amino acids, particularly threonine, on the deposition of fat in the liver of the rat. A. E. Harper, W. J. Monson, D. A. Benton, and C. A. Elvehjem.—p. 383.

Vol. 50, August, 1953

* Studies on the function and metabolism of copper. M. M. Wintrobe, G. E. Cartwright, and C. J. Gubler.—p. 395.

* Some factors affecting the growth and development of rats fed rancid fat. S. M. Greenberg and A. C. Frazer.—p. 421.

Function and Metabolism of Copper. Copper is found in blood in the plasma and in the cells. Red cell copper tends to be constant. The plasma copper, on the other hand, increases under a great variety of circumstances. Hypocupremia is rare. By far the greatest proportion of plasma copper is in the form of a copper protein corresponding to an α-globulin. A very small part of plasma copper is bound more loosely to one of several possible protein fractions and may represent copper in transit. Deficiency of copper is associated with the development of severe, hypochromic microcytic anemia, hypoferremia as well as hypocupremia, moderate leukopenia, and bone marrow normoblastic hyperplasia. In copper-deficient swine fed ample amounts of iron, the total body content of iron, as measured by chemical assay of the tissues or by measurement of radioactive iron, is low as compared with normal. Copper therapy without the simultaneous administration of iron in such animals is ineffective. In swine made deficient both in copper and iron, no increase in plasma iron follows iron therapy but an increase takes place promptly when copper is given as well. These observations are interpreted as indicating that copper favors iron absorption from the gastrointestinal tract.

Nutritional Value of Rancid Fat. Rancid fat in the diet increases the protein requirement of the rat for optimal growth. A diet containing 10 per cent rancid soybean oil supported almost normal growth in rats when all known essential nutrients were supplied in large amounts and protein constituted 30 per cent of the diet. The difference in growth between a group of rats fed rancid fat with an optimal level of all other known nutrients and a group fed an equivalent fresh fat diet can be accounted for in the main by lowered consumption of the rancid fat diets during the first days of the experimental period. The only organ seriously affected by the presence of the rancid fat was that of the intestinal tract. Whole desiccated liver, although it had effects on organ weights not attributable to its protein content alone, appeared to benefit the rats in proportion to the protein content when added to the diet. Cortisone had no beneficial effect on the growth of rats fed rancid fat under the experimental conditions employed. Several drugs administered to modify intestinal flora had no beneficial effects on the growth of rats fed rancid fat.

THE JOURNAL OF SCHOOL HEALTH

Vol. 23, September, 1953

* Accuracy of health content of school textbooks. H. F. Kilander, F. V. Hein, and H. H. Mitchell.—p. 216.

Accuracy of Health Content of Textbooks. Textbooks on health, general science, and biology were reviewed for scientific accuracy by teachers and medical and paramedical personnel. Errors were classified as: (a) factual errors; (b) misleading, ambiguous, or otherwise incomplete statements; (c) outdated statements or those otherwise no longer applicable; and (d) statements appearing controversial or debatable. Examples of each type of error are given at the end of the article. High school health texts contained the highest number of errors. Nutrition ranked high in the percentage of errors reported; the extent of error increased with the age of the book. Care is needed in reviewing textbook manuscripts for scientific accuracy. Reviewers should be selected with consideration to obtaining adequate coverage of the health fields represented. Publishers, from time to time, need to revise and schools need to replace their texts to keep up to date.

THE LANCET

Vol. 2, August 22, 1953

* The causation of tropical sprue. A hypothesis. P. Manson-Bahr.—p. 389.

Tropical Sprue. Tropical sprue is an important disease which remains a mystery. Recent work has to some extent cleared up the origins of celiac disease and idiopathic steatorrhea, which have been confused with tropical sprue. This work has shown that in celiac disease in children the gluten of wheat is chiefly responsible for the illness. It is suggested that tropical sprue is fundamentally dissimilar. It has a distinct and peculiar geographic distribution, being entirely absent from some tropical countries, notably Central and South Africa; it has an incubation period; and it may occur in several individuals closely associated or even in small epidemics. This suggests infection, perhaps by a virus. It is suggested that such a virus exists in the tongue and mouth lesions and then spreads to the intestinal tract, affecting especially the ileum.

PHYSIOLOGICAL REVIEWS

Vol. 33, July, 1953

Body fat in adult man. A. Keys and J. Brožek.—p. 245.

Physiology of calcium metabolism. R. Nicolaysen, N. Eeg-Larsen, and O. J. Malm.—p. 424.

PUBLIC HEALTH REPORTS

Vol. 68, August, 1953

* Nutrition research—potentialities in chronic disease. W. H. Sebrell, Jr.—p. 737.

* Enrichment—a public health approach to better nutrition. W. H. Sebrell, Jr.—p. 741.

* Come-up time of milk pasteurization. D. J. Hankinson, R. B. Read, W. Litsky, and R. R. Brown.—p. 769.

Public, professional, industrial allies in sanitation. M. D. Hollis.—p. 805.

Chronic Disease and Nutrition. Aging, nutrition, and public health are related in various ways, one of which is chronic disease research. Primary attention is being given to the interrelation of nutrients with enzymes, hormones, and other metabolic agents. Obesity, fat metabolism and atherosclerosis, cancer, and bone and joint diseases are discussed in relation to nutrition. The need is emphasized for striving to attain and maintain optimal health while repairing existing damage. The public is losing some of its complacency toward nutrition, and food technology is aiding the public health approach to eventual elimination of the need for specific nutritional therapy. Nutrition research and theory must be converted to food therapy, nutritional knowledge, and public health gains. The author urges that many groups

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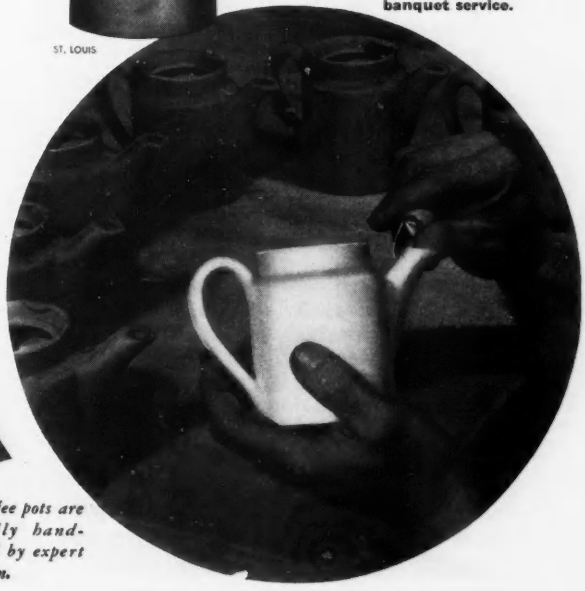

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coordinate toward this end, because scientific progress by lone investigators is no longer in order.

Enrichment. The modern attack on malnutrition should comprise enrichment, education, and research. The conquest of pellagra, beriberi, and ariboflavinosis is briefly traced. Chronic disease control can be aided with the help of enrichment, which is "low-cost insurance against nutritional ills" according to the National Research Council.

Milk Pasteurization Method. One solution to the disadvantage of high-temperature, short-time milk pasteurization, i.e., the difficulty in accurately measuring and establishing holding time, is presented. The holding time and, therefore, the holding tube are eliminated by increasing temperature to the point where only the come-up time will insure adequate pasteurization. This is the time required to heat milk to a given temperature. A diagram, dimensions, and operational data of the equipment for the method are given, as are results of preliminary studies in its use.

ADULT LEADERSHIP

Vol. 2, July–August, 1953

* A look at the mass media. W. W. Waymack.—p. 21.

Mass Media for Education. Press, motion pictures, radio, and television can all spell opportunity for voluntary groups wishing to use them for public education. Mass media, however, depend on automatic mass interest. They communicate information piecemeal, with a great preference for conflict and human interest—and consequently, real accomplishments from them come gradually rather than in splurges. Voluntary groups should invest intelligence, organization, planning, and much work and time in the use of mass media. They should analyze the media, determine how they function, come to understand them, and make plans to fit. They should equip themselves to meet the conditions of mass media operation. Persons from the mass media operation may be drawn into membership of these groups. The objective in doing this is twofold: the long-range objective is to improve the educational usefulness of the mass media; the short-range, to utilize the possibilities of "things as they are." The success of one voluntary group with mass media is described.

THE CANNER

Vol. 117, September 7, 1953

* Liquid sugar mess savings.—p. 11.

Liquid Sugar. Liquid sugar, usable by all the major categories of industrial sugar buyers, saves time and labor. One ton of the product may be handled in approximately one-fifth the manhour time required for unloading a ton of bagged sugar. The labor for handling liquid sugar is largely a matter of controlling mechanical devices; it eliminates the final packaging operation and the cost and nuisance of individual containers, and permits the use of more warehouse space. Liquid sugar is readily substituted for dry sugar in processes requiring a sirup and in certain others involving water. However, certain limiting factors do affect its use, and these are cited. Processing steps most frequently eliminated by liquid sugar users, in addition to the bag-handling operation, are listed.

COLLEGE AND UNIVERSITY BUSINESS

Vol. 15, August, 1953

* There's an ideal way to plan a university feeding facility. T. W. Minah.—p. 49.

Control of food purchasing, receiving and storing. H. T. Maschal.—p. 53.

Vol. 15, September, 1953

* New unit for food service. M. Fairchild.—p. 46.
* Food service department simplifies storeroom control. P. Baker.—p. 49.

Design for Dining. Kitchen and service area plans were made at the Men's Graduate Center of Duke University before the building itself was designed. The layout was planned with an eye to using an absolute minimum in personnel and with effective use in a relatively small area. Before the final blueprint was drawn up, flow charts were constructed and menus checked for efficiency in the use of all equipment. The receiving, storage, refrigeration, and vegetable preparation areas were planned to eliminate unnecessary backtracking. These areas and others,

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including the kitchen, are described. Floor plans and a table giving serving capacity and area spaces accompany the article.

New Food Unit. Combining the freshman and upper-class campuses at Simmons College, Boston, made a new food service unit imperative. The unit is described and photographs are shown. A description is given of the dining room, kitchen, and bake-shop.

Dollar Control. Easy, economical, and effective inventory control takes place at Mississippi State College with the dollar control system. In this system, the dollar value of inventory on hand in the warehouse is known at all times, and no attempt is made to account for individual items. All buying is done through the college purchasing department, and control is also affected by two strict regulations: the controller's office will not pay for merchandise for the food service department if not reported on the daily warehouse report, and the storekeeper must have a requisition signed by an operating unit manager to account for each issue from the storeroom.

FOOD

Processing · Packaging · Marketing

Vol. 22, August, 1953

* A Swedish food factory. C. H. Sporle.—p. 320.
* Fruit and vegetable storage. E. Hardy.—p. 337.

Swedish Food Factory. The Swedish firm described operates a large modern flour mill and yeast factory, in addition to a macaroni factory which has the largest output in Sweden. The preparation and packaging of flour, yeast, and macaroni are discussed in detail, with photographs of various operations. Flour in Sweden has been enriched with thiamine, riboflavin, and niacin since 1944.

Fruit and Vegetable Storage. Cold storage conditions for fruit and vegetables are reviewed, including developments in wrapping, quick-freezing, and chemical coatings for produce. A table gives storage requirements for some common fruits and vegetables, i.e., maximum storage period, temperature, and relative humidity. In another table, permissible storage periods are given for conditions when the atmosphere contains carbon dioxide. Fungicides are discussed briefly, and varieties of food best suited to cold storage are suggested.

FOOD ENGINEERING

Vol. 25, August, 1953

* Wire belt conveyors. How to choose them . . . how to mount them. Part II. J. F. Reid.—p. 72.
* Versatile licorice—its food uses mount. . .processing detailed. FE Staff.—p. 82.
* New fungicide—sorbic acid.—p. 127.

Wire Belt Conveyors. Many special features extend the versatility of wire belt conveyors. Pointers are given on the use and care of the conveyors, including: retaining selvages, surface adjustments, and dividers; belt installation and adjustments; and cleaning and maintenance. The author warns that a belt, although correctly aligned before loading, may become misaligned at any time. Therefore, frequent check-ups will pay. A four-point check list is included for this purpose.

Licorice. An easily-mixed sirup has been developed from ever-popular "lickrish," or if you prefer, *Glycyrrhizin glabra*, in addition to the paste, powder, and U.S.P. extract. Uses of licorice by the food industry are as a flavoring, sweetening, foaming, and moisture-retaining agent. Licorice is finding its way into cookies, soft drinks, meat sauces, and cereals. Biggest use of the sirup and the paste is in confectionery. Licorice has been satisfactorily blended with such flavors as peppermint, vanilla, and even fruit flavors. However, the U. S. must go far to equal the Europeans, especially the British, in the use of licorice for confections. Surprising to many, licorice-flavored candy need not be black; the pure extract is brownish-black. The preparation of licorice for use in food products is described in detail. A fivefold operation, it involves shredding, extracting, clarifying, concentrating, and finishing.

Sorbic Acid. Sorbic acid, a new fungistatic agent, may be instrumental in salvaging the estimated 20 million lb. of cheese which are ruined annually by mold. Other uses of the agent, as shown by tests, are: inhibition of molds growing on meats, and inhibition of

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yeasts and molds which develop during the curing of cucumbers—without interference with the normal fermentation of the latter. Sodium benzoate, in wide use for this type of food protection, has certain disadvantages which are covered in this article. Rat-feeding tests indicate that sorbic acid is harmless at extremely high consumption levels. If it performs to cheese manufacturers' satisfaction on a large scale, standards of identity for cheese products will be reviewed at a formal hearing, with the objective of including sorbic acid as an optional ingredient. While it is an effective fungistatic agent, sorbic acid cannot be expected to replace good sanitation practices and methods.

FORECAST FOR HOME ECONOMISTS

Vol. 69, September, 1953

* Cooking with fats for flavor. J. Rock.—p. 34.
* The use of "realia" in home economics. H. Fleck.—p. 37.
* Training school lunch personnel. T. G. Flanagan.—p. 56.

Fats Mean Flavor. Fats and oils contribute palatability to foods, no matter what cooking method is used. The proper place of fat in the diet, with neither over- nor under-use, is noted. Classes of fats, temperature control, and the advantages of frying foods are also covered. The author gives two rules as all-important in fat cookery: "use the proper type of fat for the food in question and the method by which it is to be prepared," and "whatever the frying fat, whether solid or liquid, use it properly and treat it with respect during and after its use, if you want foods to look and taste their best."

Teaching with Real Objects. "Realia," i.e., authentic material, can make the abstract and remote "come alive" for home economics classes. Students should be encouraged to bring actual foods, household equipment, brand labels, and other items into the classroom. The teacher may also wish to survey the community for possible sources of realia. Opportunities for the use of realia in home economics should be a challenge to the teacher.

Training School Lunch Personnel. Employment standards for school lunch workers, which have lagged far behind the rest of the program in development, do not attract the better educated woman. Unsatisfactory practices now in use include: paying workers out of the children's lunch contributions; holding training sessions they cannot attend without remaining away from home overnight; irregular personnel policies; and no assurance of autumn reemployment when school closes for the summer. Specific training courses, including some on-the-job instruction, are needed. Salaries should come from the school budget and be graded according to the importance and quality of the employee's work. Incentives for improvement should also be provided. Florida's efforts to meet these needs are described. A planned training program has been set up, and it is suggested that manuals are needed as an aid in setting up courses which are planned, as Florida's are, on a problem-solving basis.

HOSPITAL MANAGEMENT

Vol. 76, August, 1953

* How diet affects growth and health. W. H. Sebrell, Jr.—p. 80.

Effects of Nutrition. Research may some day lead nutritional science to victory over metabolic disorders, just as it has conquered the common deficiency diseases. A few examples of the complex interrelation of nutrients in the body are given. Recent findings are discussed regarding nutrition and chronic disease, e.g., vitamin B_{12} and macrocytic anemia, citrovorum factor for anemias, cholesterol in atherosclerosis, and others. The author attributes the gain in growth and health of Americans in recent years to better nutrition. He also notes the poor diet of nations producing short, small-framed persons, which may indicate a close interrelation between nutrition and genetics. Many frontiers still exist in nutrition research, in which cooperative efforts of many governmental and private groups will be required. One of these is the need for assessing the nutritional status of various populations; another, exploration in detail of the relation of nutrition to chronic disease; still others, food planning for a national emergency and the appraisal of food legislation. Closely connected to all phases of the work, of course, is nutrition education.

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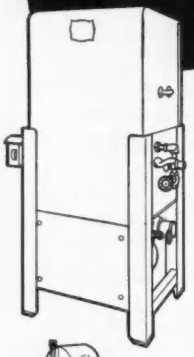

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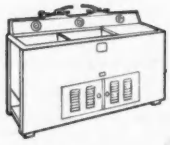

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THE HOTEL MONTHLY

Vol. 61, September, 1953

* Top flight service of foods and beverages.—p. 45.

"Hotel in the Sky." An airline company was observed during preparation and packaging of food for sixty-two persons on a California-to-Hawaii flight. Food and beverage service is offered throughout these 10-hr. trips three times. Split-second timing and thorough knowledge of quality food preparation and service are essential. All the material must be packed in special containers, put in the limited space in the plane, and served many hours and miles later. A dinner and a full-scale buffet meal are served, and typical menus for each are given.

INSTITUTIONS MAGAZINE

Vol. 33, September, 1953

* Look into new food products as aids to varied, better menus. A. A. Frooman.—p. 26.

Menu merchandising triples volume.—p. 36.

Time, motion study makes for less effort but more work. D. E. Lundberg.—p. 42.

* Shortcut to sauce cookery.—p. 49.
* Industries turn to skills of food service profession. S. M. Hartt.—p. 57.
* How to get most out of spices, herbs on menus.—p. 60.
* Glass cleaning can be easy; try these tips. H. Ansley.—p. 65.
* Grass roots sanitation plan: self-inspection. K. C. Vester.—p. 128.

Advice on meat care, selection given operators.—p. 133.

* School sanitation plan aimed at protecting youth's welfare. W. H. Haskell.—p. 138.
* Join others to cure hiring ills, operator says.—p. 144.

Simple menu writing called modern trend.—p. 151.

Plans made to cover nation for sanitation.—p. 152.

Aids from food service forum

* Kitchen equipment hints given by panel of experts.—p. 152.
* Tips on china selection, care told by expert.—p. 152.
* Attractive food called essential in merchandising.—p. 152.

* 4 serving lines provide rapid food service.—p. 167
* Cookies in quantities.—p. 190.
* "Little" details add up to practical service total.—p. 196.

New Food Products. Institutions can help alleviate menu monotony by utilizing the new ready-to-use food products. These items can be especially valuable in such operations as some schools and camps. However, institutional food buyers must learn to judge quality and value, because most specialty foods are not subject to industry-wide standards. The Department of Agriculture standards for canned meats are discussed and illustrated in detail by a description of standards for corned beef hash.

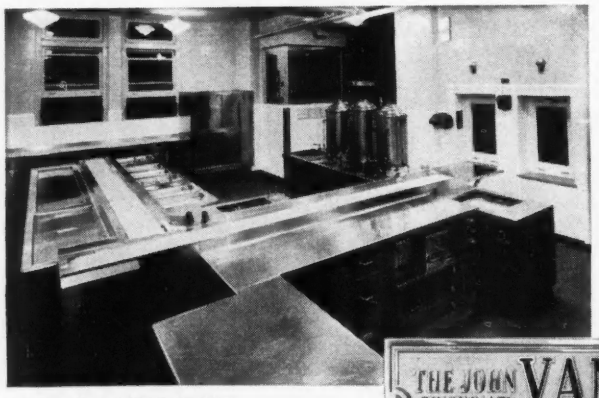
Sauce Cookery. A canned condensed basic sauce, recently perfected, is a short cut to quality sauce preparation for institutions. Two years of research were spent on this sauce which: won't curdle, lump, or separate when reheated; will be less likely to stick or burn even when boiled; can be refrigerated without harm for one or two days; can be frozen and reheated without damage to taste or texture; and offers excellent cost control. The content of the basic sauce is given, as well as the ingredients to add in making variations.

Industry Needs Skilled Food Service. Skilled management is necessary to assure high standards of industrial food service. The advantages of management by an outside food company vs. those of the company or employee committee management system are discussed. Each of the four types of in-plant feeding operations is noted, i.e., cafeteria, lunchroom, cart service, and box lunch.

Spices and Herbs. "Quality results in economy" is the most important fact to remember about purchasing spices, because grades exist for each of the fifty major spices, herbs, and aromatic seeds. Frequent purchasing of spices in moderate amounts is the key to freshness. Proper care of spices is discussed, as well as new developments in the field. A comprehensive table lists the more popular seasoning items, together with descriptions and principal uses.

Glass Cleaning. Care of glass has increased in its complexity with the use of more and more glass in modern building construction. Nature, i.e., weather, smoke, and grime, is one factor to be considered; another is personnel—the right man for window-washing, and his safety equipment. A job breakdown of window-washing is presented.

Sanitation Eye-Opener. Rocky Mount, North Carolina, has had a



Kitchen Serving Area
BETHESDA HOSPITAL
Cincinnati 6

Superintendent • LAWRENCE BRETT
Architect • JOHN HARGRAVE

THE JOHN VAN RANGE CO. CINCINNATI, OHIO, U.S.A.
EQUIPMENT FOR THE PREPARATION AND SERVING OF FOOD

helping Bethesda Hospital improve service . . . . cut costs

★ Bethesda Hospital patients have better food service . . . hotter, more attractive food at the bedside . . . since the recent food service reorganization in which Van assisted. Two kitchens were consolidated into one. Centralizing tray service and installing the conveyor effected amazing economy.

★ Superintendent Brett estimates conservatively that *personnel savings have cut overall food service costs 25%!* All new equipment is shining stainless, assuring savings in upkeep for years. It is understandable why Betheda Hospital has been a steady Van customer for more than quarter of a century. In fact, repeat customers have been a Van tradition *for more than a century.*

★ If you have food service equipment needs . . . new, expansion or modernization such as Bethesda's . . . it will pay you to call Van.

The John Van Range Co.
EQUIPMENT FOR THE PREPARATION AND SERVING OF FOOD
DIVISION OF THE EDWARDS MANUFACTURING CO.
Branches in Principal Cities
341 EGGLESTON AVENUE CINCINNATI 2, OHIO

Now—A coffee with dietary advantages

Coffee has not always been particularly kind to the digestion, and it can be a problem in the case of patients on certain special diets.

But today coffee in its most modern form—Borden's Instant Coffee—is better tolerated by delicate stomachs.

It's less likely to cause digestive upset and is suitable for many of those patients on special diets.

Why?

Because the coffee oils usually responsible for rancidity, off-flavor, and consequent digestive disturbance have been eliminated from Borden's Instant Coffee. In addition, it has a low sodium content, no added carbohydrates, and it's low in calories.

The combining of these advantages with the rich full body and flavor of finest coffee is a result of Borden's special low-temperature vacuum-drying process, more costly but more satisfactory than the commonly employed spray-drying method.

This process, which makes Borden's Instant Coffee so fine a product, was developed out of Borden's experience in dehydrating perishable foods—experience that has yielded such products as Starlac (non-fat dry milk), Bremil (powdered infant food), and Klim (powdered whole milk).

Manufacturers and distributors of BORDEN'S Instant Coffee
STARLAC non-fat dry milk • BORDEN'S Evaporated Milk
Fresh Milk • Ice Cream • Cheese
BREMIL powdered infant food • MULL-SOY hypoallergenic food
BIOLAC infant food • DRYCO infant food •
KLIM powdered whole milk

The *Borden* Company
350 Madison Avenue, New York 17, N. Y.

"grass roots" sanitation plan since 1950, sponsored by the city health department and the Junior Chamber of Commerce. The program consists of a periodic check of sanitation in the kitchens, dining rooms, classrooms, and public washrooms in the city's schools and food service operations. In schools, the teachers, principals, and pupils participate in weekly and monthly check-ups. This is not a cure-all, nor is it intended to replace regular instruction or official inspection; rather, it is an effective and simple method of sanitation self-appraisal.

School Feeding Sanitation. Sanitation in school lunch feeding operations, as well as in food service for higher institutions, is essential to student and employee well-being. Temperature and bacterial control are emphasized in vegetable care, clean hands for food service employees, handling of frozen food, and dishwashing care. The author urges that school lunch operators use the services of state and local health department sanitarians, and that training classes in sanitation be conducted for all employees.

Cooperation to Fight Labor Problems. Food operators may find help in solving personnel problems by exchange of ideas. Five ways to alleviate labor turnover are suggested: recognition for employees, opportunity for advancement, opportunity to be heard, adequate wages, and feeling of security and belonging. Another incentive for working in the restaurant business can be provided by old-age and other benefits. General tips for supervisors are listed at the end of the article.

Kitchen Equipment Hints. Suggestions on dishwashing, flooring, air conditioning, and other equipment matters were given in a panel discussion at the recent Restaurant Management Conference at The Pennsylvania State College. Detergents for dishwashing are classified. Other hints on equipment presented at the discussion are reported.

Chinaware. Such questions on chinaware are considered as "What are good cup shape and handle designs?" "What are the types and costs of decoration?" "What colors are best?" and others.

Attractive Food in Merchandising. Menu clip-ons and other advertising won't sell unappetizing food. Good merchandising involves four principal factors: atmosphere or personality of a dining room, a pleasing menu, good food, and good service.

Fast Food Service. Four food counters are used for students and faculty at a Philadelphia junior high school. The kitchen layout is shown in a floor plan, and photographs of the kitchen and serving areas are shown. Cross-traffic is eliminated in this plan for serving 1250 students in three 45-min. lunch periods. Student self-service is used throughout.

Cookies. A good cookie supply is convenient and popular in institutional food services. Cookies are a dessert item without "leftover" waste and retain freshness and flavor fairly long. Comparatively little preparation time is required to keep a stock of cookies on hand, and they adapt themselves well to mass production. Cookies can be turned out *en masse* with considerable variety, without disrupting routine production of other items. Hints on cookie production are given.

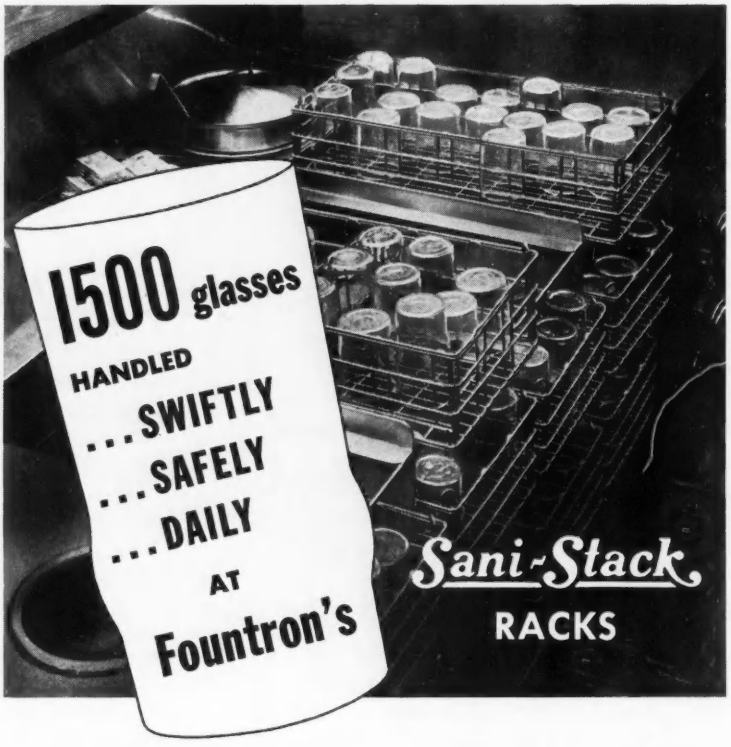
Details Aid Food Service. Many small details were considered in the remodeling of a Chicago high school food service. Meal planning is done on a limited basis: three inexpensive student lunches and a higher-priced faculty meal are usually offered. A separate canteen counter furnishes sandwiches, desserts, and beverages. In addition to three walk-in refrigerators, extra freezer storage boxes are provided for the frozen meats used throughout Chicago's public school lunch system. The serving and food preparation areas are described in some detail.

THE MODERN HOSPITAL

Vol. 81, September, 1953

* What good is a dietary consultant? M. C. Jones.—p. 108.

Dietary Consultation. Indiana hospitals have found the state nutrition consultant an aid in raising standards and solving problems in their dietary departments. The consultant's activities include hospital licensing and consulting services and planning new dietary fa-



Sparkling, clean glasses washed swiftly and safely, with the aid of Sani-Stack racks helps Fountron's in St. Louis build and hold its reputation for "finest food and fastest service."

In laying out the food service facilities, Mr. Frank Hilliker, consultant on the job, used all the latest devices, including Sani-Stack racks, to save time, work, labor and speed up service.

Used glasses are placed in Sani-Stack racks on a conveyor, carried to the washing machines and returned to the service station with only one handling. The open construction of the wire racks insures complete washing in shortest time. Their sturdy construction assures years of service.

Sani-Stack racks are available for dishes, glasses, cups, trays, silverware, etc. in sizes to fit every washing machine. They are saving time and cutting breakage in eating places everywhere. They can save you money, too. Write for full information.

See our exhibit at Booth 297, National Hotel Show

Metropolitan WIRE GOODS CORPORATION
70 Washington Street, Brooklyn 1, N. Y.

ST. ANTHONY'S HOSPITAL
St. Petersburg, Florida

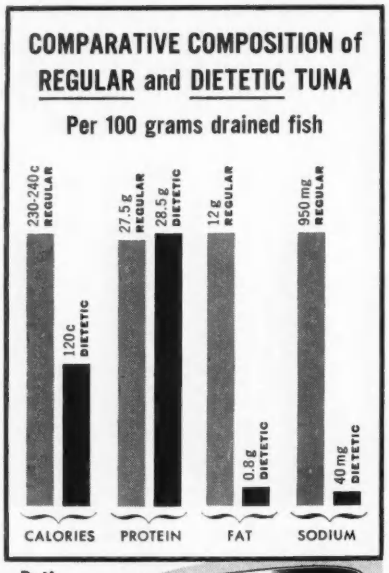
It must be good

That Sherman Blend coffee has been granted the Good Housekeeping Seal of Approval is evidence of merit. But the fact that over three-quarters of a million cups are served every day in the year, in the leading hospitals, hotels, restaurants, steamship lines, camps and clubs, is the best evidence of the popular acceptance that this coffee has come to enjoy. It is a tribute in tonnage to the smooth flavor and rich body of this exquisite guest coffee. Try it and see!

JOHN SEXTON & CO., CHICAGO, 1953

Dietetic Tuna
for the treatment of the
Geriatric Patient

For the geriatric patient, Dietetic Tuna meets the need for an easily digested, readily assimilated, high-protein food. Palatable and adaptable to variations in preparation, it is an important item in the menu of the elderly patient with a poor appetite. Requiring minimal mastication, Dietetic Tuna is ideally constituted as a high-proten, low-cholesterol food for the aged individual with poor dentition.



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Please send samples and complete information on DIETETIC TUNA.

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cilities. She also gives consulting service to child-care institutions and county homes for the aged. Activities related to the licensing program deal primarily with conducting surveys of the hospitals to determine their degree of compliance with the dietary and sanitary standards used in administration of the program. The history of these activities is traced from the initial statewide survey in 1948, the year the consultant was appointed to the state board of health's nutrition staff. Hospitals have been assisted in such areas as menu planning, sanitation, revamping food service methods, figuring food costs, and many others. The consultant aids in planning for new hospital facilities under the Hill-Burton Act by reviewing plans and specifications and helping prepare equipment lists for dietary departments. Physicians have been contacted for review of modern trends in diet therapy, and nurses have been shown educational films. Four dietary refresher conferences have been held recently throughout Indiana, and printed materials, including a bibliography of available nutrition material, have been developed for use in this work.

NURSING OUTLOOK

Vol. 1, August, 1953

* An experiment in the use of problem-solving methods. H. L. Bunge.—p. 446.

The opportunities before us. A. Gregg.—p. 448.

A mental health approach to nursing arts. M. Crawley.—p. 454.

* Teaching the audio-visual way: opaque material. F. L. Moak.—p. 456.
* Today's training reduces tomorrow's problems. G. G. Chappell.—p. 457.
* Emotional problems of the premature infant's parents. D. G. Prugh.—p. 461.

Problem-Solving Methods. A five-year experimental project related to a course in research principles and methods has been an activity for candidates for the master of nursing degree at Frances Payne Bolton School of Nursing, Western Reserve University. The course, content of which is described in detail, is designed to help students gain facility in using problem-solving methods and participating in group study of problems. Although formal evaluation of the course will take place at the end of 1953, some informal evaluation has been attempted each year. On the whole, students believe the research course is rewarding and promises usefulness.

Audio-Visual Aids. Hints on preparation and care of audio-visual teaching aids are given, to keep them in good condition. Photographs illustrate the methods recommended. Suggestions for sources of materials are given.

Correct Training. Instruction, properly planned, will save time and money when employees finally are trained. The author stresses the incompleteness of mere "telling" or "showing," and urges a proper combination of the avenues of learning (the five senses) with sufficient time for the learner to practice. Invisible costs of improper or inadequate training are listed, and simple rules for the trainer are given.

Premature Infants' Parents. Emotional reactions of the parents of premature infants are discussed. Anxiety seems to be greater in proportion to the smallness of the baby. Suggestions are given to the nurse for a clinical approach whereby her support and her understanding of the parents' emotional needs can aid them in learning to care for the infant at home.

PERSONNEL JOURNAL

Vol. 32, September, 1953

Legacies of the salary freeze. A. Patton.—p. 133.

* Trainees grouped themselves and selected their problems. E. E. Jennings.—p. 140.

New Training Method. Conferences, probably the most popular training method, usually suffer from too much time spent ironing out communication and organization problems, leaving insufficient time to reach group agreement, the real objective. An experimental program was conducted simultaneously with a standard conference procedure. In the new program, trainees were free to select their associates and problems, move from group to group, and study the problem and submit solutions to the leader before the training session. The experimental group achieved a higher rate of agreement than the "control" group. Other benefits of the new method were increased group solidarity, loyalty, participation, and attendance. Few disadvantages resulted.

RESTAURANT MANAGEMENT

Vol. 73, August, 1953

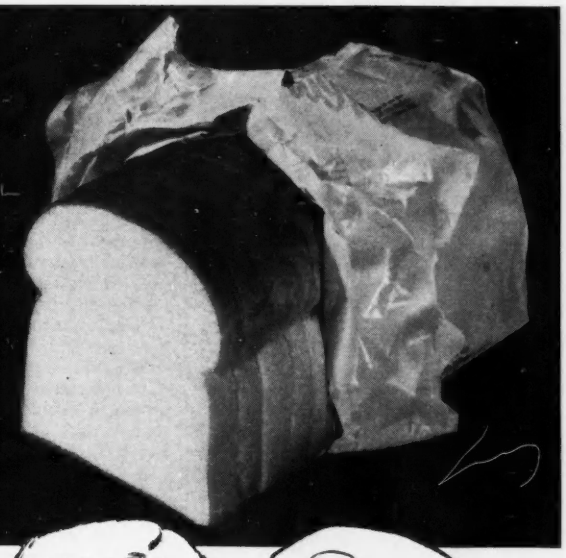
* New trends in food. N. Greene.—p. 22.
* How a famous Chicago bakery freezes food for subsequent sale.—p. 38.
* Pricing menus to the penny. J. J. Kalez.—p. 39.
* Building a bigger breakfast business. A. Easton.—p. 40.
* Forequarter of beef—more meat for your money. P. F. Muellet.—p. 45.
* Pies that appeal to summer appetites. M. L. Casteen.—p. 54.

New Trends in Food. Tomorrow's hickory-smoked meat may never have been near a fire! In a new process, meat travels along a track to meet a burst of heat, and quick-freezing seals in the flavor. . . A formula for canned fresh milk is in the growing-pains stage at a Miami milk company. The milk is heated enough to kill bacteria but not to cook out palatability. . . Two soy flour products are being tried in place of chemical bread softeners to give what bakers call "crumb softness" . . . A new cooking oil, made from rice bran, neither oxidizes as easily as other vegetable oils nor picks up flavors and odors of food fried in it.

Prefrozen Baked Goods. A Chicago bakery wheels most of its products into freezers for holding at 10°F. When needed, they are reconstituted at not more than 200°F. This limited heat precludes outside condensation. The method is used for most of the bakery's goods except custards and marshmallow products; even its specialty, whipped cream cake, holds up in this way.

Penny-Pricing for Profit. Food

What enriched bread is doing for America today



Enriched bread, representing the bulk of bread consumed today, makes significant nutrient contributions to the dietary and to the nutritional health of the American people.[1] Bread cannot be regarded merely as an energy food. Instead, it is an important purveyor of many nutrients which a large proportion of our population would never receive in adequate amounts if enriched bread were not available on so large and wide a scale.[2] Here is what modern day enriched bread provides:

VITAMINS: Containing specified amounts of thiamine, riboflavin, and niacin, enriched bread makes a significant contribution to the satisfaction of these vitamin requirements. Enriched bread has played an important role in virtually eliminating frank deficiency diseases and materially reducing subclinical deficiency states resulting from dietary inadequacies in these essentials.[2]

MINERALS: By providing substantial amounts of calcium[3] and of added iron, modern enriched bread goes far in satisfying the needs for these substances. For example, six ounces of bread on the average provides approximately 15 per cent of the day's recommended calcium allowance for adults and 38 per cent of the iron allowance.

PROTEIN: The protein of commercial bread is of high biologic value because it is a mixture of wheat flour protein and milk protein, the latter derived from added nonfat milk solids.[4] One pound of enriched bread furnishes about 39 Gm. of protein.

ECONOMY: At its present day low price, bread represents an outstanding nutritional "buy." It provides not only generous amounts of essential nutrients, but also readily available food energy. These features truly make enriched bread one of America's *basic foods.*

The Seal of Acceptance denotes that the nutritional statements made in this advertisement are acceptable to the Council on Foods and Nutrition of the American Medical Association.

REFERENCES

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2. Flour and Bread Enrichment, 1949-50: Prepared by The Committee on Cereals, Food and Nutrition Board, National Research Council, 1950.
3. Data furnished by the Laboratories of the American Institute of Baking, Chicago, Illinois.
4. Sherman, H. C.: Chemistry of Food and Nutrition, ed. 8, New York, The Macmillan Company, 1952, pp. 212; 597-600; 646.

AMERICAN BAKERS ASSOCIATION

20 NORTH WACKER DRIVE • CHICAGO 6, ILLINOIS

Du Bois Service..

SIMPLIFIES SANITATION...

MAKES THE JOB EASIER!

From glasses to garbage cans . . . whatever your sanitation problem . . . your local Du Bois Service Representative has the right answer.

For over thirty-one years, Du Bois has led in pioneering personal engineered service and in product development to fit every institutional sanitation need. There is a Du Bois Service Representative and a Du Bois Warehouse near you . . . ready to serve you at any hour.

DU BOIS PRODUCTS

for Engineered Sanitation include . . .

K-O-L SUPREME . . . For excellence in machine dishwashing.
D-LITE . . . For no-film hand dishwashing.
S-U-D-S . . . Super Sudser for pots and pans.
ACTEX . . . For kitchen floors and refuse cans.
TEMP . . . For tile, porcelain and metal.
NEUTRALAVE . . . Safe, fast cleaner for fine composition floors.
NEUTRA-GLOSS . . . Heavy-duty, skid-resistant floor wax.

For authoritative help on any sanitation problem, write THE DU BOIS COMPANY, Attention: Director, Customer Service, Cincinnati 3, Ohio.

The Du Bois Company

CINCINNATI 3, OHIO . LOS ANGELES, CALIF.

cost percentages, as studied in the government for thousands of establishments, showed a surprising range from 31 to 76 per cent. Further study revealed that food cost percentages were not affected by gross sales, size and seating capacity, business hours, or sales volume. This left only one factor to explore: sales volume as affected by menu prices. Establishments with menus priced to the penny had, on the average, a 2 per cent lower food cost than those which priced to the nickel. They also appeared to have more accurate and detailed systems of food cost accounting. Pricing to the penny, which necessitates accurate weighing and portioning of foods, makes the restaurateur more conscious of his cost system.

Bigger, Better Breakfasts. Restaurants can tempt the coffee-sipper or breakfast-skipper by intriguing menus suggesting appetizing combinations which can be served quickly. The satiety value of fat-containing foods is noted, and the new low-calorie diets in which fat is permitted are cited to substantiate this comment. Bulk can be valuable for satiety, e.g., serving fruit instead of juice on low-calorie menus. Unusual fruit and entrée combinations are suggested.

Forequarter of Beef. Beef, the most popular meat, is discussed in the fourth of a series of articles on increasing meat profits by a new cutting method. A carcass-shaped diagram shows the way to cut, and percentage yields of cuts are given. Photographs of the cutting procedure are also included. Pointers are given on buying beef on the wholesale market; maximum number of portions; shorter cooking time with less shrinkage; elimination of wasteful cuts; improved carving of cooked meats; increased yield in cuts with better customer acceptance and selling at a better price; selection of suitable wholesale cuts, carcass weights, and grades; ground beef; cured and processed beef cuts; and meat by-products. A total breakdown of a 160-lb. forequarter of beef as to weight, cost, and portions is given on a photographed blackboard.

Fruit Pies. The proper procedure for baking fresh fruit pies is discussed. A sugar mixture is given for fruits containing the average amount of juice, and two methods of combining it with the fruit are described. Three kinds of binding agents, with detailed instructions for use, are suggested. Rules for making chiffon and parfait pies with canned or frozen fruit are given.

WHAT'S NEW IN HOME ECONOMICS

Vol. 17, September, 1953

* Pounds and inches. D. V. Whipple.—p. 56.
* Self-interest as motivation in teaching nutrition to teens.—p. 60.
* Obesity—a serious health problem.—p. 64.
* Standard spice terminology.—p. 68.
* Solving the recruiting problem of home economics. L. White, Jr.—p. 132.

Child Growth. The pattern of increase in height and weight from birth to maturity is outlined, with emphasis on the proportional differences between a baby and an adult. Slow and rapid growth periods are reflected in the child's needs for food and sleep. The tiny infant's huge appetite is noted, as is the toddler's decrease which worries many mothers. Likewise the small appetite of the grade school child, which expands into voraciousness at puberty, is related to requirements. The adolescent's need for sleep is also discussed.

Teaching Teens Nutrition. The recent Pennsylvania study of adolescent nutrition showed shocking deficiencies, possible reasons for which are cited. Excerpts are given from interviews with young boys and girls concerning nutrition. A table recommends optimal weekly intakes of major food groups for boys and girls in three age groups from twelve to twenty. Nutrition teaching in public schools is not adequate, i.e., no accepted teaching practice exists, and there is insufficient information in textbooks. To show what those past their teens think and do about nutrition, results are given of a survey of women from twenty to thirty-five years of age.

Obesity. Education of the public concerning proper food selection is the only safe road to weight control. Too many people consider malnutrition as being caused by too little food; few realize overeating can cause the same condition. Public interest in obesity is increasing; unfortunately, food faddists are taking advantage of this interest. A community weight control project in Louisville is described.

Spice Terminology. The American Spice Trade Association has launched a drive to standardize the labeling terms for fifty major spices. Consumers have heretofore been confused by the plethora of descriptive terms on labels and in recipes. Names of spices, and terms for various forms, are listed in tabular form. Food writers, editors, and home economists are receiving a list of the uniform terms.

Home Economics Recruitment. Do college women consider home economics second-rate because men don't major in it? Home economists cannot let recruiting plans wait until women overcome their feminine inferiority complex; they must consider realistically what can make their profession more attractive. The quantitative failure in recruitment is closely related to qualitative failure. A study of intellectual abilities of college graduates majoring in various fields puts home economics next to the bottom of the list. Therefore, home economists should ask themselves if their curriculum offers enough challenge and mental excitement for the able student. A need to broaden the scope of home economics is stressed. Every course should be taught in the full context of family studies, and family studies and household arts must be more closely dovetailed with the liberal and creative arts. Career-minded girls can be attracted by emphasis on the opportunities in home economics—which field will give them something to write and talk *about*. A "sales campaign" alone will not solve the recruiting problem; home economics must be completely rethought as an academic discipline.

. . . . please patrons by serving

"NABISCO INDIVIDUALS"

RITZ CRACKERS

in individual cellophane packets

only 1¢ PER SERVING

Everybody loves RITZ . . . America's favorite cracker . . . It's smart to serve RITZ regularly . . . with orders of soup . . . salad . . . tomato and other juices.

- Each package contains two Ritz Crackers . . . just right for individual servings.
- Easy to handle . . . no time wasted in counting crackers.
- Less breakage . . . no waste of bottom-of-the-box pieces.
- Money saving . . . because they're lower cost per serving.

OTHER FAMOUS "NABISCO INDIVIDUALS"

PREMIUM SALTINE CRACKERS only 1⅓¢ per serving

FOUNTAIN TREATS less than 1⅗¢ per serving

DANDY OYSTER CRACKERS less than 2¢ per serving

SEND FOR FREE SAMPLES AND NEW BOOKLET . . . packed with ideas on how to increase sales and cut food cost with NABISCO products including: *PREMIUM Saltine Crackers • DANDY OYSTER CRACKERS • FOUNTAIN TREATS • RITZ CRACKERS • OREO Creme Sandwich • TRISCUIT Wafers* ®

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National Biscuit Co., Dept. 27, 449 W. 14th St., New York 14, N.Y.
Kindly send free samples and new booklet "America's Home Favorites."

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Organization.....

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NATIONAL BISCUIT COMPANY

News Notes

Michigan Nutrition Day. A Nutrition Day, co-sponsored by the Michigan Nutrition Council and Michigan State College, was held at the College on October 12. The program included the following speeches:

"World Food Problems"—Dr. L. A. Maynard, Director, Cornell University School of Nutrition, Ithaca, New York

"The Role of Soil in Producing Food of High Nutritive Value"—Dr. Lloyd M. Turk, Director, Agricultural Experiment Station, Michigan State College, East Lansing

"The Philosophy of Food Fortification"—Dr. E. M. Nelson, Chief, Division of Nutrition, Food and Drug Administration, Washington, D. C.

Also included in the program were group sessions on "Food Fortification," "The Soil as It Affects the Nutritive Quality of Food," "Food from the Garden to the Table," "Chemicals in Foods," and "Fluoridation of Public Water Supplies."

Sanitation Standards. Most recent of the new series of "Standards" being established by the National Sanitation Foundation are those for "Spray-Type Dishwashing Machines" which are listed and explained in the new booklet, "Standard Number 3." It is available from the Foundation, Ann Arbor, Michigan, for 50 cents a copy. Detailed specifications for equipment which will meet these standards and be eligible for the Seal of Approval are enumerated.

The Foundation recently announced that soda fountain and luncheonette equipment bearing the seal is now generally available, the standards having been issued a little less than a year ago. A list of approved models of the eight companies which manufacture equipment in accordance with the NSF "Standard Number 1" is being prepared for distribution to health departments.

Post-Doctoral Awards. For 1954–55, the University of Chicago is again offering three post-doctoral fellowships, valued at $4000. The purpose of the fellowships is to acquaint established research workers in the biologic, physical, and social sciences with the role of modern statistical analysis in the planning of investigative programs and in the analysis of empirical data. Further information may be obtained from the Committee on Statistics, University of Chicago, Chicago 37.

Interns Graduate. Commencement exercises for nine dietetic interns at *Freedmen's Hospital, Washington, D. C.*, were held on September 18. Dr. R. Kelley Brown, Associate Professor in Medicine, Howard University School of Medicine, addressed the graduates. Certificates and pins were awarded. Members of the class are: Robert V. Cole, Prairie View A. & M. College; Delores M. Daugherty, Tuskegee Institute; Olivia Hinds, Hampton Institute; Rubye M. Jackson, Virginia State College; Melisande V. Manning, Morgan State College; Gloria B. Moore, Virginia State College; Millie C. Norman, Tuskegee Institute; Mildred Saylor, Hampton Institute; and Verdelle M. Williams, Southern University.

Certificates and A. D. A. pins were presented to six dietetic interns at *Shadyside Hospital, Pittsburgh*, at a dinner given recently in their honor. The graduates are: Mary Jo Dunn, Julia Hermes, Mary F. McArn, Barbara Mitchell, Marilyn Riffle, and Elizabeth Tarquinio.

Ten dietetic interns graduated from the Food Service Division of *Brooke Army Hospital* on October 9. Col. Prentice L. Moore, the hospital's Deputy Commander, gave the commencement address, and Maj. Gen. Martin E. Griffin, Commanding General, presented the certificates. The graduates, all second lieutenants, are: Barbara A. Bargen, Ruth E. Damon, Mary M. Diggs, Mary L. Fisk, Luz E. Gutierrez, Martha L. Howe, Sarah A. Martin, Patricia E. Mooney, Dora Anne Powell, and Ruthie M. Randolph.

Food and Container Institute News. The statistical services of the Quartermaster Food and Container Institute for the Armed Forces, Chicago, have been incorporated into the office of the Scientific Director. This move by the Institute permits joint planning of research among various divisions of the Institute and ready analysis of research results by statistical methods. Kenneth R. Wood, Institute statistician since 1950, has been named chief of the newly formed Statistical Design and Analysis Office. The new office will advise both food and container experts concerning the statistical planning of all experimental work, interpret the results of such work, and as time permits, carry out research on experimental test design and methodology.

American Chemical Society Awards. Dr. Betty Sullivan, Vice-President and Director, Russell-Miller Milling Company, Minneapolis, has been awarded the American Chemical Society's Garvan Medal for 1954, it was announced during the Society's 124th national meeting in Chicago in September. Dr. Sullivan, an authority on wheat and flour chemistry, was the first woman to receive the Thomas Burr Osborne Medal of the American Association of Cereal Chemists. She is a member of the advisory board of the American Chemical Society's *Journal of Agricultural and Food Chemistry*. The gold Garvan Medal is given annually to recognize "distinguished service to chemistry" by women chemists.

The Borden Award in the Chemistry of Milk will go to Dr. Donald V. Josephson of The Pennsylvania State College. The purpose of this $1000 award is to encourage research in the chemistry of milk in the U. S. and Canada.

Plentiful Foods. The U.S.D.A. lists the following foods expected to be plentiful during November:

Fruits and vegetables

Onions	Potatoes
Pears, winter	Raisins

Protein foods

Beef
Dairy products
Turkey

Other foods

Honey	Salad oils
Lard	Table fats
Pecans and almonds	Vegetable shortening

Meeting. The 1953 Annual Convention of the *National Society for Crippled Children and Adults* will be held in Chicago, November 12 through 14.

Col. Perry Weds. Col. Miriam E. Perry, Chief, Women's Medical Specialist Corps of the U. S. Air Force, was married to Maj. Moxie F. Goll, MSC, USA, on September 26 in Arlington, Virginia.

Government Publications. *The Problem of Restricted Dietaries with Special Reference to Low Sodium Diets*, by Jane R. Spinella, has been published as Report 107 by the Army Medical Nutrition Laboratory. This sixty-one-page offset report details the results of a metabolism and nutrition project undertaken "to study and develop nutritionally adequate low sodium diets with a variety of recipes for palatable, acceptable, and satisfying foods for hospital and home use." The method of setting up the dietaries and menus is described, as well as the calculation of the nutritive value of the diets. A bibliography of twenty-five references is included, as are recipes and various statistical tables. The nineteen recipes, all for 50 servings, are for meats; breads and cereals; desserts including cake and cookies; gravies; and beverages.

The eighth in the *Recipes for Quantity Service* series (PA-226, Food Service VIII) has been released by the Bureau of Human Nutrition and Home Economics, U.S.D.A. Fourteen tested recipes developed by the Bureau's staff are given. All portion yields are for approximately 25, 50, and 100 servings. This booklet, as well as previous issues in the series, may be obtained from the Bureau, Washington 25, D. C.

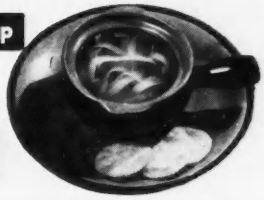
FOR MENU MAGIC THAT WHETS APPETITES

Meat

Vegetables

BELOW: *4 of the many GROEN Kettles serving in a large midwestern college.*

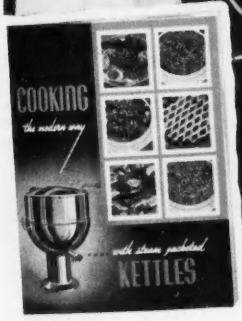
Soup



Casseroles

Cereal

. . . use the kind of cooking that's kind to foods. Protect their rich flavors, preserve their color, nutrients, texture; and present them appetizingly . . . done to perfection in GROEN Stainless Steel Steam Jacketed Kettles . . . THE MODERN WAY TO COOK. Read details in FREE BOOK offered below). Unsurpassable in performance and positive quality-control for just about every food. Faster, simpler, more labor-saving. And sanitary in the strictest sense. Ask your dealer . . or write us for Bulletin R51-A.



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Send for it. 44 pages of valuable cooking counsel by leading specialist. A boon to modern cooking. Read it!

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Break Menu Monotony
without breaking rules—use JELL-O's

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... it's sweet but Sugar-Free!

Wonderful D-ZERTA, made by the makers of Jell-O, comes in the six delicious Jell-O flavors, delightfully sweetened with saccharin... it contains only 10 calories per serving (sugar-sweetened gelatins give you up to 83 calories per serving!) ...it's absolutely carbohydrate free... *and it costs only 4¢ to 5¢ a serving!* Take the boredom out of low-calorie and low-carbohydrate diets—treat your patients to D-Zerta!

D-Zerta is now available in the dietetic section of grocery stores! Look for the new package containing 3 or 10 two-portion envelopes. Complete nutrition information, plus some exciting new recipes with every package!

D-ZERTA
MADE BY THE MAKERS OF JELL-O DESSERTS
D-ZERTA
DELICIOUS GELATIN DESSERT • SWEETENED WITH SACCHARIN • CARBOHYDRATE FREE
FOR LOW-CALORIE DIETS
IMITATION STRAWBERRY FLAVOR

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Made by the makers of **JELL-O**

PERK UP YOUR PATIENTS WITH THIS LEMON FRUIT D-ZERTA

Dissolve 7 grams Lemon D-Zerta in 1 cup *hot* water. Chill. When slightly thickened, add:

2 tablespoons (30 grams) drained, pitted, quartered unsweetened cherries (red or light),

2 tablespoons (30 grams) drained, diced unsweetened pineapple (cooked or canned). Divide evenly to fill 2 molds or sherbets and chill until firm. Makes dessert or salad.

Report on Schools of Public Health in the United States by Dr. Leonard S. Rosenfeld, Dr. Marjorie Gooch, and Oscar H. Levine, is the title of Publication No. 276 of the Public Health Service, Department of Health, Education, and Welfare. Described in this 110-page report are: the schools and their programs; facilities, staff, and students; financial status of the schools; and the needs of schools of public health. The publication contains revised criteria for accreditation of public health courses. Thirteen tables are also given, dealing with various phases of the schools. This report is available from the Government Printing Office, Washington 25, D. C., for 35 cents a copy.

A Directory of 2002 16-mm. Film Libraries has been released by the U. S. Office of Education as Bulletin 1951, No. 11. It lists the 16-mm. film libraries in the U. S. by states and cities. The annotation of each library contains three items of basic information: (a) the number of films in the library; (b) the nature of these films, i.e., entertainment, educational, and so forth; and (c) special restrictions, if any, on the distribution and use of the films. This booklet may be obtained from the Government Printing Office, Washington 25, D. C., for 35 cents a copy.

Leaflet on Facts and Fallacies. "Who Knows Which Are Facts—Fallacies?" is the title of a new leaflet by Anna dePlanter Bowes, published by the Bureau of Nutrition, Pennsylvania Department of Health. The first page contains ten questions on food with "yes" and "no" blanks; on the remaining three pages the correct answers are given in some detail. The leaflet is obtainable on request from the Bureau of Nutrition, Pennsylvania Department of Health, Harrisburg.

Pamphlet on Milk. "Milk—Not Strictly for Babies" is a new, eight-page pamphlet on the nutritive value of milk, recently released by the Minnesota Department of Health. The text includes a general discussion of milk and its various forms and recommends intakes for children, adults, and the special needs of pregnancy and lactation. A "Basic Seven" chart is included, and hints are given on keeping milk safe. This pamphlet was tested for comprehension by the lay reader according to the reading-ease formula of Flesch, and a paper describing the testing method used will appear in an early issue of the JOURNAL. "Milk—Not Strictly for Babies" may be requested from: Section of Maternal and Child Health, Minnesota Department of Health, University of Minnesota Campus, Minneapolis 14.

Food Patterns in South Carolina. Results of a study on food habits made by the South Carolina Agricultural Experiment Station have been released in bulletin form. The report is divided into two parts, the first of which deals with a cooperative study with the Food and Container Institute for the Armed Forces in which eating patterns of middle-aged farm and city men are com-

Get more salad orders with KRAFT Mayonnaise

The right dressings bring more salad orders and the right dressing for most of your salads is Kraft Mayonnaise. Here's true mayonnaise at its finest . . . luxuriously rich, made from costly salad oil, eggs, fragrant vinegar and seasoning. *Nothing else!*

Kraft Mayonnaise has a smoothness and flavor you'd find hard to match with even your own especially prepared dressings—plus giving you the added advantage of eliminating costly preparation time.

It's sure to please more of your customers . . . make more salad sales for you! Order Kraft Mayonnaise in 1 gallon jars from your Kraft Institutional representative today.

THE NATION'S TASTE IS

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KRAFT Foods Company INSTITUTIONAL DIVISION

TRUE MAYONNAISE

AT ITS FINEST

Tomato Aspic

Kraft Mayonnaise
Tomato aspic **Leaf lettuce**

Prepare tomato aspic. Pour into individual ring molds and chill until firm. For each serving, unmold a portion of aspic on lettuce. Fill the center of the mold with Kraft Mayonnaise in a lettuce cup.

NEW GARBAGE DISPOSER FOR DIET KITCHENS!

THE NEW

WASTE KING

COMMERCIAL *PULVERATOR* ®

MODEL DK 3

specially designed for diet and ward kitchens in hospitals.

HERE'S HOW WASTE KING CUTS COST, SPEEDS SERVICE, IMPROVES SANITATION—

- Saves space formerly used by garbage cans.
- Saves time, saves labor cost. Eliminates handling, washing and replacement of cans.
- Quickly eliminates all garbage; even eliminates paper napkins, placemats, straws, paper cups in reasonable quantities.
- Eliminates breeding place for flies and vermin.
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Exclusive "Hush-Cushions" give quiet, smooth operation. Exclusive Lifetime Grind Control prevents clogging. Swivel impellers assure jam-free operation.

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AMERICA'S FINEST GARBAGE DISPOSER

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pared. The second section of the bulletin covers farm family meals of whites and Negroes in a tobacco area of the state. Tables showing acceptance values of foods are included, as well as menus for the farm families, with notes on methods of food preparation. The bulletin, titled "Menu Patterns and Food Preferences in South Carolina," is available from the South Carolina Agricultural Experiment Station, Clemson Agricultural College, Clemson.

Fresh Prune Juice. Sparkling clear scarlet juice from fresh prunes hasn't yet come to the table, but a method for its manufacture is reported by the U.S.D.A.'s Bureau of Agricultural and Industrial Chemistry. Research on both French and Italian prunes was done in cooperation with the industry at the Western Regional Research Laboratory in Albany, California, motivated by the supply of fresh prunes which exceeds the demand. Fresh prunes were washed in cold water, heated just enough to inactivate the enzymes, strained to remove pits and skins, treated to prevent jellying, and finally put through a bag-type press and a filter. The resulting colorful juice is suitable for concentration or the usual processing for bottling. Adding some of the volatile flavor captured during the heating of fresh prunes gave an even finer juice. Tests showed that a cold storage temperature is important for holding the flavor and color of the concentrate.

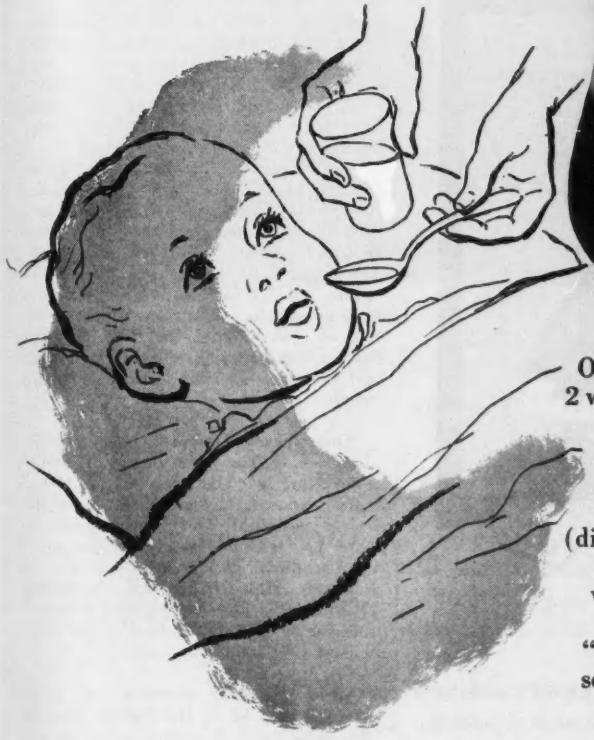
Dry Milk in *Tortillas*. Nonfat dry milk, a modern food product, added to the ancient Mexican *tortilla*, is a means suggested by the New Mexico Agricultural Experiment Station for improving family nutrition in that area. Edith Lantz, taking a hint from commercial bakers who have found that 3 to 6 per cent dry milk improves white bread, tested dry milk in *tortillas* and developed an acceptable recipe for the traditional *tortilla* made with *harinilla* (a specially-treated ground corn).

Speedy Vegetable Preparation. The U.S.D.A. suggests several ways to accelerate vegetable preparation. Spinach or other greens, it is suggested, should be put in a large pan or sink of water and patted gently to loosen grit and soil without bruising, then lifted out instead of draining off the water. In that way, the leaves are lifted from the soil which has settled to the bottom. . . A vegetable brush is an improvement over fingers for removing silk from sweet corn. To hold an ear of corn steady for cutting kernels off, impale it on the sharp end of a nail driven through a cutting board. If corn is to be prepared in quantity for freezing or canning, it may pay to use a curved cutter designed especially for the purpose.

Rutabagas for Ascorbic Acid. Research at the Maine Agricultural Experiment Station has shown the rich ascorbic acid value of the rutabaga. Rutabagas can help fill the need of people in that area where the short growing season makes it difficult to produce enough

citrus is virtually

NON-ALLERGENIC



TYPICAL PATCH TEST

Over 400 infants and children from 2 weeks to 6 years of age acted as test subjects to check the incidence of sensitivity to orange juice. After 2 to 12 months' observation,* "no disturbance of bowel function (diarrhea or constipation) that could be attributed to the orange juice" was found. Also, the occurrence of regurgitation and rashes was "minimal". In the rare instances of sensitivity, care exercised by gentle reaming of juice (or the use of frozen concentrate) to avoid contamination with peel oil usually obviates the difficulty.

**J. Pediat. 39:325, 1951*

FLORIDA CITRUS COMMISSION • LAKELAND, FLORIDA

FLORIDA *Citrus*

ORANGES • GRAPEFRUIT • TANGERINES

ascorbic-acid-rich foods for year-round use. Rutabagas also store well for winter use when other foods high in ascorbic acid are scarce, and they retain this vitamin well during storage at cold temperatures. Tests showed that ascorbic acid losses were negligible in rutabagas stored at 32°, 34°, or 40°F. After three months' storage at 40°F., the rutabagas sprouted. The traditional home method of storing rutabagas is to cut off the tops and cover in moist sand in cold storage pits or cellars. The Maine study indicated that for increased ascorbic acid content and palatability, cooking methods in many cases should be changed. Many homemakers cooked rutabagas too long or put them on to cook in cold water or in large quantities of water, all of which causes heavy ascorbic acid losses. The Station recommends putting the vegetable in a small quantity of boiling water in a covered kettle and cooking until just tender—about 20 min. This saves about 70 per cent of the ascorbic acid. It is also believed that better cooking, selection of the most palatable varieties, and better growing methods could increase the popularity of rutabagas.

News of State Associations

Alabama Dietetic Association. The fall meeting of the Alabama Dietetic Association was held in Birmingham, October 9 and 10. The program included:

"Medical Future in Alabama"—Dr. J. J. Durett, Dean, Medical College of Alabama, Birmingham

"Public Health Future in Alabama"—Dr. D. G. Gill, Director, Alabama Department of Public Health, Montgomery

"Nutrition Education in Germany"—Elizabeth Hoene, Alabama Polytechnic Institute, Auburn

The program also included tours of the dietary departments of the VA Hospital, Jefferson Hospital, and the Crippled Children's Clinic.

Michigan Dietetic Association. Rosemary Detwiler, a senior at Marygrove College, Detroit, is the 1953 recipient of the Michigan Dietetic Association's annual scholarship. The award, consisting of $120, has been offered for the past two years to home economics seniors in Michigan colleges, as an encouragement to apply for and complete an A. D. A.-approved internship. Miss Detwiler has chosen the University of Michigan Hospital.

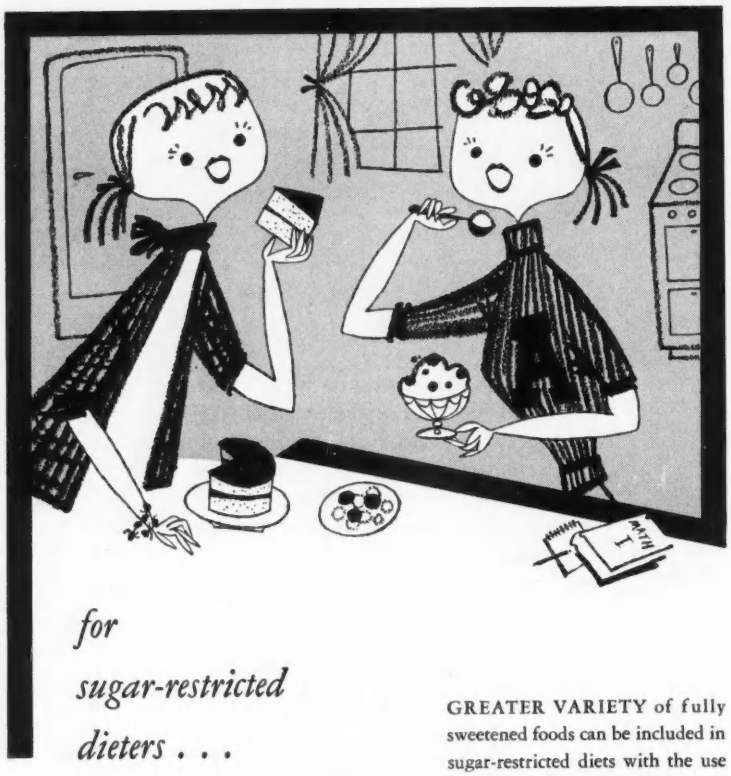
New officers for the Michigan Dietetic Association are: President, Dr. Dena C. Cederquist, Michigan State College, East Lansing; and Secretary, Margaret Wilson, University of Michigan Hospital, Ann Arbor.

The *Ann Arbor Dietetic Association* announces the following officers for 1953–54: President, Myrtle Meritt; Second Vice-President, Kathleen Hamm; and Secretary-Treasurer, Melba Pickenpaugh.

New Jersey Dietetic Association. Members of the New Jersey Dietetic Association held their 21st Annual Meeting in Newark on October 1. Dorothy Height, national YWCA staff, spoke on "Are You a Good Discussion Leader?" Dr. Bradford N. Craver, Johnson & Johnson, New Brunswick, discussed "Hormones." The meeting also included a choice of trips to a school or the Prudential Life Insurance cafeteria.

Ohio Dietetic Association. Officers for 1953–54 of the *Dayton Dietetic Association* are: President, Jean Tucker Coleman; President-Elect, Barbara Lorenz, Miami Valley Hospital; Treasurer, Mary James Mahaffey, Stillwater Sanitarium; and Secretary, Robert Nicholson, Wright-Patterson Air Force Base.

Pennsylvania Dietetic Association. The *Philadelphia Dietetic Association's* 1953–54 season opened with a fall reunion and dinner at Friends Hospital in September. Members were hostesses to dietetic interns and home economics students. The National Restaurant Association-Standard Brands film, "America's Heritage of Hospitality," was shown. In October, the group heard Irene Milewski, United Fruit Company, discuss "Foods on Parade." Miss Milewski's talk was accompanied by a demonstration. At the November meeting, Margaret L. Ross, 1953 recipient



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GREATER VARIETY of fully sweetened foods can be included in sugar-restricted diets with the use of SUCARYL, because this new non-caloric sweetener can be used in all cooking, baking, canning and freezing processes without losing sugar-like sweetness. Dieters appreciate it, too, because there is no bitter or metallic aftertaste in ordinary use. SUCARYL is available at all pharmacies in both tablet and solution forms, including a calcium solution for use in low-salt diets. A supply of calorie-saving recipe booklets may be obtained by writing Abbott Laboratories, North Chicago, Ill.

. . . with non-caloric Sucaryl® (CYCLAMATE, ABBOTT)

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the Answer to the Breakage Problem~

in the four cafeterias where ELI LILLY AND COMPANY* serves 140,000 meals a month!

Daily food service for over 7000 employees alone is a feat in itself. To this problem, Eli Lilly and Company applies the same skill and planning that has made Lilly one of the great names in pharmaceuticals and medical research.

Lilly cafeterias have been using Boontonware now for four years. Pleasing style and attractive colors entered into its selection. But best of all, Boontonware has proved to be the answer to their breakage problem. Management and employees alike sum up Boontonware's four year record this way: *Highly Satisfactory.*

* Merit Award Winner, INSTITUTIONS MAGAZINE's 6th Food Service Contest.

COLORS TO MIX OR MATCH

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GOLDEN YELLOW
CRANBERRY RED
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Wherever style and durability are important, Boontonware's top performance is a matter of record. Find out what it can do for your food service operation.

See your regular Supply House or write to us for the name of your nearest Dealer.

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fine dinnerware fashioned of MELMAC®

Boontonware complies with CS 173-50, the heavy-duty melamine dinnerware specification as developed by the trade and issued by U. S. Department of Commerce, and conforms with the simplified practice recommendations of the American Hospital Association.

TO MEET CS 173-50 OF THE HEAVY DUTY MELAMINE TABLEWARE INDUSTRY MOLDED

BOONTON MOLDING COMPANY, BOONTON, N. J.

of the Mary Swartz Rose Fellowship (see the JOURNAL for October, page 1022), will discuss "The Professional Growth of the Dietitian in Service."

Future activities of the *Philadelphia Association* for the year are planned as follows: A Community Nutrition Section meeting in January will feature a panel discussion on "Where, When, How Does the Dietitian Correlate Her Work with That of the Agencies in the Community?" Frank J. Escobedo will speak on "Personnel Policies" at the February meeting, and in March, members will tour the new foods building at Philadelphia General Hospital. The annual banquet, in conjunction with the state meeting, will be held in April. The Diet Therapy Section will present a program in May at Lankenau Health Museum Auditorium. After a tour of the Health Museum, the group will hear Dr. Katheryn Langwill, the Museum's Director of Health Education, discuss "The Use of the Health Museum as an Aid in Teaching Nutrition."

South Dakota Dietetic Association. The 4th Annual Meeting of the South Dakota Dietetic Association was held in Pierre, October 21 and 22, with the following program:

"Personnel Training"—Helen Eisenberg
"Acquainting Ourselves with State Resources"—A panel
"The Department of Public Health"—G. J. Van Heuvelen, M.D.
"Hospital Facilities Division"—Thomas Schultz, Administrator; Edna Davidson, Nurse Consultant; Lewis Remiley, Sanitation
"The Department of Public Instructions—Home Economics Supervisor"—Margaret McEniry
"Therapeutic Diet Today"—Doris Odle, Treasurer, A. D. A.

Members toured the South Dakota Capitol Building after the meeting.

Officers for 1953–54 are: President, Sister M. Dorothy, St. John's McNamara Hospital, Rapid City; President-Elect, Dr. Lida Burrill, South Dakota State College, College Station; and Secretary-Treasurer, LeOtia Glaus, Black Hills General Hospital, Rapid City.

Texas Dietetic Association. Officers for this year of the Texas Dietetic Association are: President, Dr. Florence Scoular, North Texas State Teachers College, Denton; President-Elect, Mary Ellen Dambold, Baylor University, Dallas; Vice-President, Jonnie McCrery Michie, Texas Technological College, Lubbock; and Secretary, Jane McCorquodale Fisher, Houston.

NARY A CHIP...to mar it's beauty!

Takes the high cost out of Breakage Replacements..

Molded of Modern MELMAC Plastic for Long-Lasting Service and Beauty

Now you can have beautiful dinnerware—finest quality for quantity food service—and cut replacement expense as much as 80%. Arrowhead is molded of the durable new melamine plastic, actually hard to chip, crack or break, in the popular wide rim pattern that shows off food to best advantage.

And you'll gain additional savings in time and labor because Arrowhead is light weight, easy to handle and easy to wash. Safe in automatic dishwashers and boiling water, it passes the most rigid sanitary standards.

Ask your dealer to show you all the Arrowhead advantages that help you balance your dinnerware budget.

A complete line in five lovely pastel shades.
Write for color catalog.

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creators of BROOKPARK, DESERT FLOWER and EFFICIENCY WARE

Association Activities

Representatives at State Meetings. National representatives recently attended or will attend the following state dietetic association meetings:

October 2–3—Ruth M. Yakel, Colorado Dietetic Association, Fort Collins
October 15–16—Grace Bulman, Tennessee Dietetic Association, Nashville
October 17—Grace Bulman, West Virginia Dietetic Association, Huntington
October 21–22—Doris Odle, South Dakota Dietetic Association, Pierre
October 22–23—Corinne Robinson, North Carolina Dietetic Association, Montreat
October 30—E. Neige Todhunter, Florida Dietetic Association, Tallahassee
November 12–13—Mary Reeves, Kansas Dietetic Association, Wichita
November 13—Doris Odle, Nebraska Dietetic Association, Lincoln
November 13–14—Esther A. Atkinson, South Carolina Dietetic Association, Columbia

Annual Meeting. Total registration at the 36th Annual Meeting held in Los Angeles was 2698. The 37th Annual Meeting of the Association will be held in Philadelphia, October 26 to 29, 1954.

UNESCO. The Fourth National Conference of the U. S. National Commission for UNESCO met at the University of Minnesota, September 15 to 17. Lucy Mulqueen represented our Association.

Citizenship. The Eighth Annual National Conference on Citizenship was

pure sweetness . . .

without calories

'Saxin' is prepared especially for diabetics, overweight persons, and those who can take little or no sugar.

'Saxin' gives a pure, sweet taste to all foods and beverages; it keeps its flavor when boiled or baked; even cooking with acid fruit does not alter its taste.

Freedom from metallic aftertaste is an outstanding characteristic of 'Saxin'.

Write for a free professional sample bottle of 200 'Saxin'

'Saxin'® brand **saccharin**

Supplied in Bottles of 200 and 1,000
Each product is equivalent in sweetening power to one teaspoonful or one lump of cane sugar.

Burroughs Wellcome & Co. (U.S.A.) Inc., *Tuckahoe 7, N. Y.*

held September 17 to 19 in Washington, D. C. This conference is sponsored cooperatively by the National Education Association and the U. S. Department of Justice. Sadye Adelson attended as our official representative.

Steering Committee. Adelia Beeuwkes was the A. D. A. representative at the meeting of the Steering Committee concerned with planning for the National Conference on Trichinosis to be held in Chicago next spring. The committee meeting was held in Ann Arbor on October 2.

American Council on Education. Ruth Spencer was our official representative at the meetings of the American Council on Education held in Washington, D. C., October 8 and 9.

Revised A. D. A. Publication. "The Best of Health to You," a nutrition health education leaflet, has been restyled. The new issue is now available at the same prices:

Single copies	$ .03
Lots of 50	1.25
Lots of 100	2.00

News of Products and Services

National Canners Association announces the publication of a new booklet by its Home Economics Division, titled *So Easy Recipes—and So Good, Too!* This 49-page publication contains some 120 recipes, tested and chosen by taste-testers in the Association's kitchens, plus other suggestions for using canned foods. Included in the booklet are suggestions for "pantry-shelf" meals, a paragraph on the information in labels, and a chart of canned food containers, giving weight, yield in cups, and a short description of each. An index is included.

Edward Don & Company now has lucite food-display bowls available in 12-, 14-, 17-, and 20-in. diameter sizes. The bowls are non-toxic, odorless, and tasteless; may be washed in water no hotter than 160°F.; have clear smooth walls without ridges, ribs, or decorations to catch food particles; and have roughened bottoms for better surface grip. The manufacturer suggests that the bowls be used for salads, punch, or fruits, or that a small bowl be placed floating on ice in a larger one for artistic display.

Colorful twin leaflets by *Sunkist Growers* give facts about Sunkist quick-frozen orange juice concentrate and Sunkist lemon juice and concentrate for lemonade. The orange juice leaflet defines the juice, discusses packaging, use, and storage, and gives miscellaneous hints. A conversion table for using undiluted frozen orange juice in recipes is given, as well as six recipes. The lemon leaflet also defines the juice and gives hints for storing and use. Sizes of containers and number of containers per case for the various lemon products are tabulated. Five recipes conclude the leaflet. Both leaflets contain a few "recipe tricks," including how to sour milk.

"When the Doctor Says: Cut Down on Salt!" was prepared by the Nutrition Research Division of *Sunkist Growers*. This eight-page pamphlet suggests lemon as a "pepper-upper" for low-salt meals and contains a list of foods to use and avoid and general hints for the dieter.

Pfaelzer Brothers, Inc. has published a twenty-page illustrated folder titled "How to Get the Results You Want and the Controls You Need with Pfaelzer Brothers' Portion-Ready Meats." The folder explains the quality, size, inventory, cost, labor, and waste control which, according to the company, "Portion-Ready" meats insure. "Oven-Ready" roasts, which are claimed to have the same advantages, are introduced in the folder. Forty-two portion-ready and oven-ready items are illustrated in color.

Swift and Company has just published *The Chef's Perpetual Menu-Planner*. The book lists 112 meat courses, with three preparation variations for almost all, making a total of 300 main courses. These are accompanied by a flexible course menu list of 29 dishes. By the ingenious interleaving of the physical format of the book, 54,880 complete menus with variations are possible. The center spread in the book includes a summary of cuts from a prime rib of beef, and preparation of these various cuts is illustrated. The book is available for $5 from the Hotel Sales Department, Swift and Company, Chicago.

VACUUM JUG S-3012-IV

Legion is first with an all stainless steel Vacuum Jug. Lustrous platinum finish and attractive border design.* No liners to replace. Light weight, easy to clean, no breakage. These Legion jugs will maintain liquid temperatures — hot or cold — for hours. Available in 10 oz. and 20 oz. capacities.

"Coffee or Tea?"

LEGION has the answer in Stainless Steel!

Fully insulated handles — seamless drawn bodies — heavy gauge stainless steel throughout — sanitary perfect pour spouts — double thick extra strong hinges — welded spouts and bases — lustrous platinum finish with attractive border decorations* to supplement the finest china, glass and silver service.

No breakage • Easy-to-clean
Non-porous • Chip proof • No replating
No polishing expense
A lifetime investment

Write for catalogues: **LEGION UTENSILS CO.**
21-09 40th Ave., Long Island City 1, N. Y.

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21 East Van Buren Street, Chicago, Illinois
420 Market Street, San Francisco, California

*SCAVULLO PAT

LEGION UTENSILS CO.

PIONEERS IN STAINLESS STEEL

Chef's special of the month— easy, economical— NESSELRODE PIE!

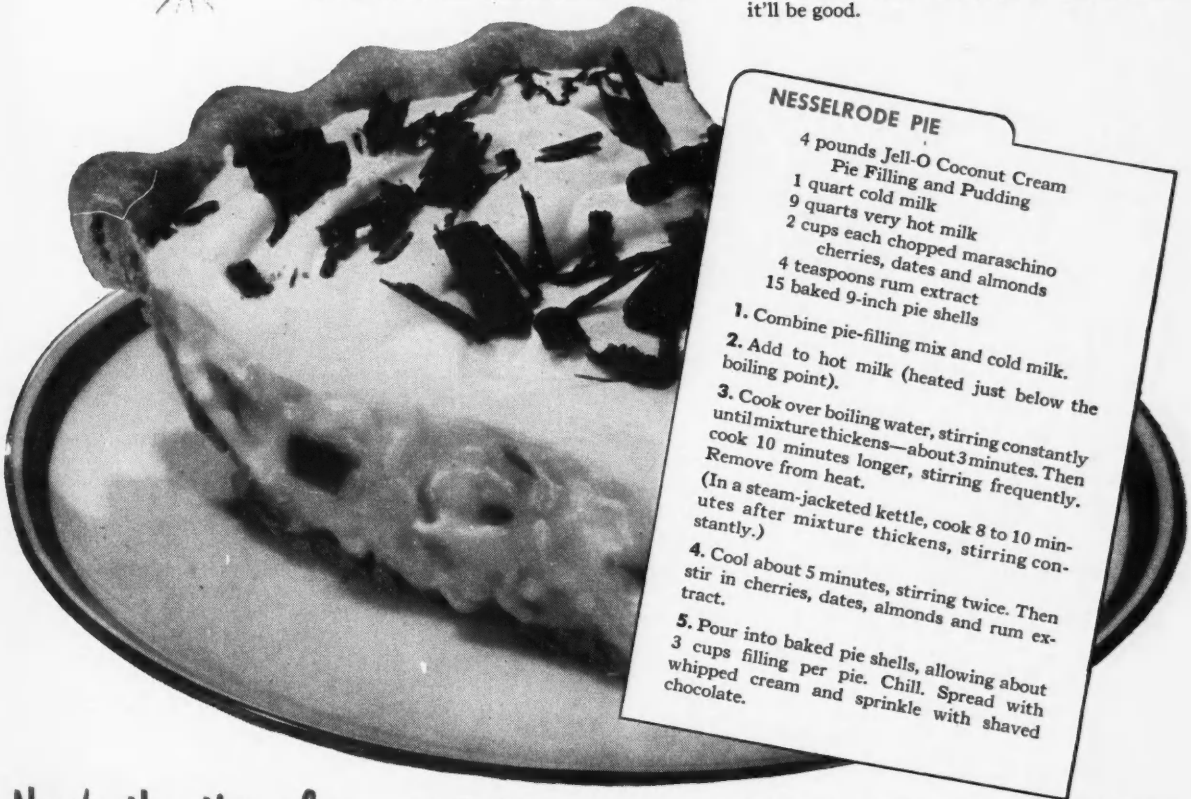
For just about 41¢ per 9-inch pie, you can serve your customers the most festive holiday treat in town!

Nesselrode Pies aren't difficult to make, either. Like all the hundreds of delicious, inexpensive, genuine Jell-O desserts, these pies can be prepared in jig time by simply following the recipe on this page.

The flavor's reminiscent of chilled egg nog—and every slice *looks* wonderfully inviting with all those chopped cherries, dates and almonds peeking through the sides.

Try this wonderful recipe. Serve Nesselrode Pie the easy way ***today***, and make ***everybody*** happy—your pastry cook, your customers.

P.S. Be sure you make Nesselrode Pie with genuine Jell-O Coconut Cream Pie Filling and Pudding. That's the only way to make ***certain*** it'll be good.



NESSELRODE PIE

4 pounds Jell-O Coconut Cream Pie Filling and Pudding
1 quart cold milk
9 quarts very hot milk
2 cups each chopped maraschino cherries, dates and almonds
4 teaspoons rum extract
15 baked 9-inch pie shells

1. Combine pie-filling mix and cold milk.

2. Add to hot milk (heated just below the boiling point).

3. Cook over boiling water, stirring constantly until mixture thickens—about 3 minutes. Then cook 10 minutes longer, stirring frequently. Remove from heat.
(In a steam-jacketed kettle, cook 8 to 10 minutes after mixture thickens, stirring constantly.)

4. Cool about 5 minutes, stirring twice. Then stir in cherries, dates, almonds and rum extract.

5. Pour into baked pie shells, allowing about 3 cups filling per pie. Chill. Spread with whipped cream and sprinkle with shaved chocolate.

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The *Western Growers Association* plans to prepare reports on subjects relating to technical and research developments in the vegetable and melon industry. These reports will cover nutritional values, preparation, and improvement of products. The material may be received throughout the year by writing to: Mrs. Helen Goodrich, Director of Consumer Service, Western Growers Association.

National Turkey Federation announces that a commercial package of cut-up turkey is now available for institutional use. The pack consists of one large tender tom turkey cut into its various parts. It may be used for the poaching-simmering method of cookery and for variety cooking of turkey pieces. The turkey is available either fresh or frozen, and the parts of the disjointed bird are separated according to cooking procedure.

Harlow C. Stahl Company has added to its line a "Turkey-Taker" roasting pan, so named because it holds a 25-lb. turkey yet requires minimum oven space. A feature of this pan is the "Taste-Trough," a built-in trough into which the upper pan fits tightly to seal in juices. "Turkey-Takers" are made of extra heavy-gauge aluminum to withstand severe wear and tear.

"Canned Pineapple Portfolio" is the title of a colorful new sixteen-page publication of the *Pineapple Growers Association*. Recipes are given for salads and dressings, meats and main dishes, cakes and cookies, pies and pudding, other desserts, quick breads, beverages, and appetizers.

Continental Coffee Company's Onion Soup Mix provides French onion soup in 25 min. A 7-oz. jar of the mix, ready to simmer by merely adding water, contains an amount of dehydrated onions equivalent to about 2½ lb. fresh onions. The mix is seasoned with thyme, celery, and allspice, and extra flavor is added by pretoasting the onions. One jar of mix, properly combined with water, produces from 1 to 1½ gal. soup.

Continental Coffee Company also announces the acquisition of the Commercial Importing Company of Seattle. This firm has featured Royal Corona Coffee and other institutional products for many years. Continental is now able to serve the restaurant field from coast to coast.

Metropolitan Wire Goods Corporation has developed a new rack to permit the mechanical dishwashing of coffee and tea pots with covers. The rack is designed so that the cover can hang open while the spray action of the dishwashing thoroughly washes and rinses the pot inside and out. A plastisol lining in the rack protects the finish of the pots. The rack has the stacking feature, permitting the pots to be transported, washed, and stored in the same rack.

Gerber Products Company announces that "Baby's Book," first published by the company in 1935, is now available in a new edition. Additions such as "Traveling with the Baby" and improved progress charts have been included, as well as the Certificate of Birth page which was returned to the book at the request of physicians.